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THE PROBLEM OF CERTAIN TROPICAL DISEASES IN THE WAR*

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NEW YORK CITY

TROPICAL medicine has not been one of the major specialties of American medicine, although it has been a field in which some of the most notable achievements have been made by American physicians. A few universities, especially Harvard and Tulane, have had departments of tropical medicine, but the greatest activity in this field has been carried on by the United States Army, Navy and Public Health Service and the Rockefeller Foundation. The interest of most medical schools and practitioners has been absorbed by their local problems, which have been quite different from those of the tropics. Now we are faced with the necessity of sending large numbers of troops to countries where tropical diseases are the chief hazards, and medical officers, whose duty it is to keep the troops in fighting condition, are confronted with the problem of diagnosing, treating and preventing diseases that have not been a part of their training and experience. Those of us who remain in civilian practice may also be faced with similar problems when the troops return to civil life. It is therefore appropriate to call attention to some of the problems in tropical medicine that our present national effort involves.

MALARIA

The most important of these problems is malaria, which, clinically, really comprises three separate diseases — the benign tertian and quartan types, which cause great disability but few deaths, and the malignant, tropical, estivoautumnal type, which may simulate a wide variety of other diseases, is often fatal and is frequently associated with severe complications, such as blackwater fever and profound anemia. Diagnosis is sometimes difficult because of the bizarre manifestations of this disease, and also because the parasitized red blood cells stick to the walls of capillaries during the second twenty-four hours of the asexual life cycle and may not be found in the circulating blood. The important thing is for the physician to have malaria constantly in mind in every case of illness in the tropics, and to make repeated blood examinations on consecutive days until malaria is diagnosed or definitely excluded.

The treatment of malaria is not the simple procedure that it is often thought to be. Even after a supposedly complete course of treatment with quinine or Atabrine, relapses occur in about 50 per cent of cases of tertian and quartan malaria, and in about 20 per cent of cases of estivoautumnal malaria; and in estivoautumnal malaria, the early relapse may be fully as severe as the first attack. We do not yet know whether relapses are due to the continuation of the asexual cycle in tissues outside the general circulation, such as the splenic pulp, where the parasites are protected from a sufficient concentration of the drug to kill them, or whether they are due to a so-called "exoerythrocytic form" of the parasite that multiplies in the reticuloendothelial cells of the body. The tendency in the last few years is to use short, vigorous courses of treatment for the acute attack and to treat the relapses as they occur; but many authorities still believe that the treatment should be continued for eight to ten weeks, a procedure that is very difficult to carry out in troops on active service.

The prevention of malaria in troops by the prophylactic use of quinine or Atabrine is unsatisfactory for several reasons. It requires an enormous amount of these drugs, which are now difficult to obtain. It requires responsible persons to administer the drugs to troops individually, to be sure they are taken. The drugs cause aviators to perform abnormally at high altitudes. Finally, these drugs are not true prophylactics, since they have no lethal effect on the sporozoite introduced by

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the mosquito, and only postpone the clinical disease in infected persons until the drug is no longer administered.

The prevention of malaria by the control of mosquitoes in the tropics is also a tremendous problem. Even in fixed military establishments, it requires expert organization, constant vigilance and great expense. When troops are operating in the field in endemic areas, it is impossible to protect them from infection. Bed nets are poor substitutes for adequate screening, and mosquito repellents have not been developed to a point where they will protect persons from mosquito bites longer than forty-five minutes under sweating conditions.

Even in our fixed bases in the Caribbean, the control of Anopheles breeding may be a serious problem. In one area, for instance, an important malaria vector breeds in the leaves of a plant growing high in the trees. Another problem is the transportation of dangerous species of Anopheles by airplanes and fast ships across the ocean. In 1930, *Anopheles gambiae*, the chief vector of malaria in West Africa, was discovered on the northeastern coast of Brazil and soon caused a devastating epidemic in its new habitat. By strenuous and costly efforts, the Brazilian government and the Rockefeller Foundation apparently eradicated the mosquito from the area in 1940, but the threat of its reintroduction is again indicated by the recent finding of this mosquito on three occasions in airplanes reaching Brazil from Africa.

Troops and civilians returning from the tropics to nonendemic areas of malaria in the temperate zones will undoubtedly bring with them latent and chronic malarial infections, which the medical profession must be on the alert to diagnose and treat to avoid the establishment of the disease in the civilian population. This happened in England after World War I, and may occur even in New England after the present war.

Enteric Diseases

Typhoid fever was well controlled by vaccination and sanitation in American forces during World War I, but it was not entirely eliminated, especially in France, where troops operated in unprotected areas. During the present war, with troop movements much more rapid and with large numbers of them operating in the tropics, we must expect a higher incidence of typhoid fever unless emergency sanitation is more efficient than in the last war, and unless the troops are educated to protect themselves from polluted water and food under the most trying circumstances.

The dysenteries and diarrheas were formerly the most prevalent and disabling diseases among troops in camp and on the march. In World War I, although these diseases had dropped to seventh place among the causes of illness in the American army, bacillary dysentery was an important cause of illness during the active summer campaigns in France. In the Philippines, even though there was no fighting, the diarrheal diseases caused by far the highest admission and death rates among our troops. There is at present no specific preventive against either bacillary or amebic dysentery, and although we now have effective drugs for the treatment of both conditions, some cases, especially those of amebic infection, are likely to be insufficiently treated under war conditions and may lead to chronic disability or become sources of infection among the civilian population after the war. Drug prophylaxis of both bacillary and amebic dysentery has been suggested, but the expense and labor entailed in such a procedure make it impractical except in the presence of an epidemic, and in such a situation, sufficient quantities of the drugs would probably not be available. Here again, prevention must depend solely on the most rigid sanitation and education of the troops.

The mild epidemic diarrheas must not be forgotten, since they may disable essential units during crucial periods. We now recognize Salmonella diarrhea, staphylococcus-toxin diarrhea and water-pollution diarrhea as frequent epidemic diseases among the civilian population. Although they may occur in any latitude or in any season, they are more frequent during warm weather. The greatest care in the handling and preparation of meats, salads, milk and pastries must be observed to prevent food-borne epidemics. One such epidemic was reported among troops who ate insufficiently cooked bread during World War I. Water-pollution diarrhea is perhaps likelier to occur as scattered cases in soldiers drinking from polluted sources than as an epidemic, but its possibility must be kept in mind wherever public water supplies are used, and the danger of a typhoid epidemic, following it after the usual incubation period, must always be remembered.

It may seem farfetched to mention cholera as a possible problem in our war effort. But it must be remembered that the disease is endemic in India and Central China, that there was an epidemic of it in the Philippines as late as 1934, and in the coastal regions of China in 1938, and that it is a constant threat in the Malay Peninsula and Burma. It is reported to be prevalent at the present time in Greece, and might spread easily to the Balkans, Russia and other near-by countries. Although a vaccine against it is available for the use of our military forces, protection is only partial and of short duration, and requires repetition in the endemic areas every six months.

With the destruction of cities and the migration of refugees, it will be surprising if severe epidemics do not occur, and the possible operation of our troops in devastated areas may expose them to the disease.

Miscellaneous Diseases

Epidemic louse-borne typhus fever is, of course, one of the greatest threats to armies, prison camps and starving populations in the cooler climates, but it has also been epidemic in Spain during the past two years and is almost constantly present in North Africa and China. Within the last few years, murine typhus in rats has been found to be an endemic disease in most parts of the world, being transmitted to man by the rat flea. There is only a questionable difference between the murine and the epidemic louse-borne strains of the typhus rickettsia, and evidence has been brought forward, especially from China, that the murine disease in man can give rise to louse-borne epidemics. The delousing of troops was a major activity of the medical department of the American army in France during World War I, and the maintenance of a louse-free army during the present war will require constant alertness and efficient delousing facilities. Although a vaccine against typhus has been developed, its protective power is questionable, and the results of further experimentation and of trial in large groups of exposed persons must be awaited before any statement can be made concerning its value.

Relapsing fever must not be forgotten as a louse-borne disease, which either accompanies typhus fever or appears as an independent epidemic. The tick-borne variety of the disease is widely distributed in Africa and Central and South America, and even occurs in the western United States. It must be kept in mind among troops operating in these areas.

The war in the Orient has centered about areas where bubonic plague is most prevalent. Java, Malaya, India and Central and South China have found the disease a serious problem during the present century. There are indications of its increase to epidemic proportions in certain parts of China at the present time, and with the destruction of cities and consequent migration of rats, it will not be surprising if the disease gets out of control over wide areas. Wherever there are bubonic cases, a certain number of pneumonic cases occur, and under conditions of crowding, both of troops and civilian populations, the threat of pneumonic epidemics may be present. Even in our own country, the so-called "sylvatic plague" in ground squirrels and other wild rodents has advanced from the Pacific Coast across the continental divide and is now moving slowly toward the central states. Although this will probably not be a military problem, it is a serious problem to the United States Public Health Service, whose functions are now put under stress by the war effort. Recent discovery that the sulfonamide drugs are of value in the treatment of bubonic plague is hopeful in view of the high case fatality rate of the disease. In prevention, vaccine is thus far only partly protective but is being held in readiness for troops likely to be exposed. Rat control is one of the most difficult procedures, even under the most favorable circumstances, and will hardly receive attention in any except the most seriously affected plague areas in the Orient while the present struggle lasts.

The campaign against yellow fever has fortunately eliminated epidemics of this disease in the Western Hemisphere, but the discovery of its endemic existence in the jungles of South America makes constant vigilance necessary to prevent it from extending to cities where the *Aedes aegypti* mosquito can start epidemics. In Africa, it is still epidemic as well as endemic, and its presence in the Egyptian Sudan leads to the possibility that it might be transported in infected mosquitoes to India. In the past, lack of rapid transportation from Africa has probably been the only reason why the disease has never occurred in Asia. If such a spread should now occur, the result might be one of the greatest calamities of the war. The most careful inspection and fumigation of all airplanes before leaving endemic areas and after arriving at their destinations constitute the only method by which Asia can be protected from this invasion. Vaccination against yellow fever apparently affords complete and permanent protection, and must be performed on all persons going to or through endemic areas.

Dengue fever, which may be considered a mild relative of yellow fever, is caused by a filterable virus having the same incubation and infectious periods in mosquito and man, is transmitted chiefly by *A. aegypti* and exists in nearly all parts of the tropics. It may cause disabling epidemics among troops at crucial periods. Unfortunately, one attack produces only temporary immunity so that subsequent exposure may again lead to further epidemics in the same group.

A number of other diseases should be mentioned to complete the picture of the hazards to which our troops may be exposed in the tropics. Although none of these will occur in epidemic proportions or even in high incidence, they may present diagnostic problems to medical officers or, after the war, to civilian practitioners.

Leprosy, yaws, leishmaniasis in its visceral form, kala-azar, or in its Oriental or American cutaneous

form, African trypanosomiasis, schistosomiasis, the blood-fluke disease, filariasis and hookworm are major diseases in some parts of the tropics and must be constantly kept in mind.

Mention should also be made of the effects of tropical heat on the white man. In addition to the acute conditions of sunstroke and heat stroke, and the salt loss from excessive perspiration, there are more insidious conditions that often produce disability and are not well understood. Dietary demands are different from those in the temperate zones, with a tendency to a higher relative intake of carbohydrates, which may predispose to intestinal infections. This may also be related to a greater demand on the part of the body for certain vitamins, particularly those of the vitamin B complex. In this connection, there is some evidence that thiamine requirements are higher in the tropics. Sprue is undoubtedly a deficiency disease in some way related to this field.

There is also evidence that the endocrine glands, particularly the adrenal glands, may not function normally in the tropics, as manifested by asthenia and low blood pressure. All these disturbances may contribute to the exhaustion that so often drives the white man home from the tropics, or makes him lose the energy necessary to fight a vigorous campaign there.

This brief summary of some of the medical hazards of the tropics indicates clearly that the medical officers of our armed forces should be much better prepared for service in these areas than most of them are. The Army and Navy are giving short courses in tropical and parasitic diseases to a limited number of the medical officers going to the tropics, and two medical schools have given voluntary courses to officers awaiting orders. This, however, is an emergency procedure and cannot possibly provide such knowledge to all the medical officers who should have it. Our lack of interest in the tropics and the scarcity of tropical diseases in this country have led to the almost total neglect of instruction in tropical medicine and parasitology in most of the medical schools of the country. It is not too late, however, to remedy this situation for the benefit of our present medical students, who may see service in the tropics before the war is over. Already such instruction is being organized in certain medical schools, and it should be in all of them. After the war, our interest in the tropics and the possibility of the occurrence of more tropical diseases in this country, because of returned troops and greater travel, should lead to permanent provision for adequate undergraduate and postgraduate instruction in this vital field of medicine.

THE PRESENT PROGRAM FOR THE IMMUNIZATION OF MILITARY PERSONNEL*

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RECENT advances in our knowledge of pathogenic bacteria as antigens and in the nature and immunologic properties of viruses have led to the development of a number of new procedures for the production of active immunity.

The adoption of these and the retention of the tried and true vaccinations against smallpox and typhoid fever by the United States Army and Navy, although usually making the first week or so of the recruit's service a far less agreeable period than it was heretofore, will undoubtedly help to preserve his life and maintain him in fighting trim on those fronts, ranging from the Arctic to the tropics, where he seems destined to fight.

My purpose is to review briefly such procedures as are now in routine use in both major arms of our forces and to comment on certain improvements that might be made in some of them according to investigations now in progress.

* * *

Smallpox

There is little to be said concerning vaccination against smallpox that is not familiar to everyone. In both services, it is required for all personnel and is effected immediately on induction and every three years thereafter in the Army and every four years in the Navy. Under special circumstances, such as departure for an active theater of operation, vaccination must be carried out unless it has been done within the preceding twelve-month period. During the last few years, vaccine virus propagated in tissue cultures or in the developing hen's egg has been suggested as a substitute for calf lymph. Such preparations, however, have not proved satisfactory, and the traditional material is employed

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exclusively among the armed forces as in civilian life.

Stress is laid on the use of the proper technic for introducing the virus into the uppermost layer of cells in the dermis. The medical officer also must be thoroughly familiar with the three types of reaction that may occur — immune, accelerated and primary. If no reaction or a doubtful reaction is obtained, vaccination must be repeated several times with virus of high potency to ensure that a genuine immunity exists.

Typhoid and Paratyphoid Fevers

Antityphoid vaccination is, of course, also mandatory in both services. The important observations of Grifnell,[1] published in 1932, on dissociative changes in the direction of loss of virulence and altered antigenicity that had taken place in the Rawlings strain of *Eberthella typhosa*, then almost universally employed as the source of typhoid vaccine, have led to the substitution of the highly virulent and potent antigenic P-48 strain by the Army officials. This change should definitely improve the efficacy of the vaccine.

For a time *Salmonella paratyphi* and *S. schottmülleri* (paratyphoid A and B bacilli) were omitted, but at present they are again represented in the vaccine, which contains 1,000,000,000 typhoid organisms and 250,000,000 each of the paratyphoid bacilli per cubic centimeter.

The vaccine is given in the usual three doses of 0.5, 1.0 and 1.0 cc. at weekly intervals, and the injections are attended by the local and generalized reactions of varying severity unpleasantly well known to most of us. It is possible that such variation in reaction may, in part, be attributed to the mode of administration, and it has been suggested that care should be taken to introduce the material quite superficially under the skin, first making certain that the needle has not entered a small blood vessel.

It has been found by Siler and his colleagues[2] at the Army Medical School that a recall, stimulating or so-called "booster" dose of the vaccine given in the amount of 0.1 cc. intradermally one year after the initial series of injections effectively restores the antibody level, and so presumably efficiently maintains resistance. On the basis of these observations, the Navy has adopted as routine the administration of an intradermal recall injection every year, although, so far as I am aware, the Army still holds to the older procedure of revaccinating every three years, with the exception, as in smallpox vaccination, of those persons leaving continental United States for an active theater of operations.

Since intradermal inoculation of the vaccine is usually attended by reactions of less intensity compared to subcutaneous injection, and since the antibody response is excellent, this method should come into general use in the near future.

Under present circumstances, the desirability of including the paratyphoid bacilli and possibly even other varieties in the vaccine leads to the practical certainty of severe reactions due to the presence of large quantities of unessential bacterial proteins and other constituents. The isolation of a complex carbohydrate-lipid-peptide antigen by Boivin et al.[3] in France and Raistrick and Topley[4] in England from various species of the typhoid-paratyphoid group suggested a possible method of vaccination in which the injection of a large proportion of presumably unnecessary bacterial substances might be avoided. Morgan,[5-7] in our laboratory, has produced from the typhoid bacillus grown on a medium of known constitution an antigen similar to those described by the French and English workers. Although definitely toxic, this substance has been found to stimulate effectively the production of mouse-protective antibodies when injected in extremely small amounts into human volunteers. Thus, a comparison of the antibody levels following injection of this purified antigen with those obtained after the usual series of injections with typhoid vaccine indicates that they are about equally effective. Of particular significance is the fact that, in the quantities employed, the purified antigen gave definitely milder reactions, characterized merely by local manifestations. Obviously, much further experimentation is necessary before one should contemplate substituting chemical derivatives of this sort for the whole bacillus, but the observations I have outlined encourage such research.

Tetanus

Concerning the very important problem of the prevention of tetanus, all the evidence at hand indicates that we are in a much more satisfactory position than we were during the last war, when antitoxin was the only available prophylactic. In addition to the disadvantage of using a foreign protein, —which is so liable to induce hypersensitivity,— the brevity of the period of its effectiveness following injection represents a distinctly undesirable feature. Ramon's discovery that tetanus toxin treated with 0.3 per cent formalin and maintained at 37°C. for several weeks resulted in a product exhibiting no toxicity but strong antigenicity has given us a method of safely and conveniently inducing a basic active immunity of long duration that may be quickly enhanced, when desired, by a single stimulating dose of the toxoid.

All military personnel on induction are now immunized either, as in the Army, by three injections of the plain or liquid toxoid or, as in the Navy and Marine Corps, by two injections of alum-precipitated toxoid.

The liquid toxoid is administered subcutaneously in quantities of 1 cc. at intervals of three or four weeks, and a single stimulating dose of 1 cc. is given under normal conditions twelve months after the last of the three initial injections. In wartime, a recall dose is injected during the month prior to departure for a theater of operations, unless such departure is within a period of six months subsequent to the stimulating dose or within six months subsequent to the initial series.

An emergency dose of 1 cc. of toxoid is given to soldiers wounded or burned on the battlefield, to patients undergoing secondary operations or manipulations of old wounds, when deemed advisable, and to others incurring nonbattle wounds likely to be contaminated with *Clostridium tetani*. This emergency dose in vaccinated persons appears to replace effectively the use of antitoxin.

In the Army, a record of tetanus immunization, if properly completed, is stamped on the identification tag. To wounded men who have not received all the injections or whose vaccination record is not available, tetanus antitoxin is administered at the same time vaccination with toxoid is begun.

Although parenteral injection of toxoid is far less likely to cause anaphylactic reactions than that of antitoxin, these have occurred on the administration of toxoid to persons allergic to various materials and occasionally to those who have previously received toxoid. Accordingly, in the Army, the following precautions must be observed in carrying out the vaccination: adrenalin should always be on hand, and intradermal sensitivity tests, 0.1 cc. of a 1:100 dilution of toxoid being used, should be done on all who have a history of previous allergic manifestations, who have exhibited untoward reactions to a previous dose of toxoid and who have received toxoid in the initial immunization series after an interval longer than four weeks. When mild reactions occur in the initial series, immunization can be completed by the administration of not more than 0.1 cc. of toxoid in three or four doses at daily intervals.

To my mind, these precautions are very well worth observing, not only by the medical officer but by anyone who undertakes to administer toxoid. It should, however, be clearly understood that the percentage incidence of such reactions has in the Army been extremely low and that they have in no way interfered with the tetanus-immunization program. Most of them seem to have been due to certain brands of peptone employed in the mediums for growing the tetanus bacillus. In the bacteriological laboratory at the Harvard Medical School, a medium has been developed by Mueller[8] that does not include peptone and that promises to permit the production of a toxoid that should give definitely fewer reactions.

In the Navy and Marine Corps, alum-precipitated toxoid is given in two injections of 0.5 cc. each by the intramuscular route, with an interval of not less than four and not more than eight weeks. In addition, a stimulating dose of 0.5 cc. is given once a year and repeated, if possible, before the zone of combat is entered. The emergency dose of toxoid is likewise 0.5 cc. As in the Army, to persons not satisfactorily immunized with toxoid, antitoxin is given in case of necessity, at which time active immunization with the toxoid is inaugurated.

The adoption of different preparations of tetanus toxoid by the two divisions of our forces reflects the diversity of opinion that prevails among immunologists concerning the relative merits of the plain or liquid and alum-precipitated toxoids. Certain persons in the Army prefer the former in the belief that its sensitizing properties are less than those of the alum-precipitated material and that it causes fewer reactions. There is no conclusive evidence that this is so, and certainly the convenience of administering only two doses of the precipitated toxoid is a definite advantage.

Yellow Fever

For a time, vaccination against yellow fever was required for all personnel in both the Army and Navy. Now, however, the Army has restricted its use to those about to depart for areas in which the disease is endemic. The vaccine developed by Theiler and Smith[9] of the International Health Board at the Rockefeller Foundation consists of the living virus of yellow fever attenuated in virulence by prolonged passage in chick-embryo tissue cultures. At present, such a virus, propagated in the developing hen's egg, is employed for vaccination. One dose of 0.5 cc. of the concentrated virus-containing material, diluted 1:10 with sterile physiologic solution, is injected subcutaneously. Immunity results within a period of seven to ten days and lasts for at least three or four years and probably much longer. In perhaps 5 per cent of those inoculated, mild febrile reactions may be expected from the fifth to the seventh day following vaccination. Yellow-fever vaccine should not be given at the same time as smallpox vaccine, and an interval of at least five days must elapse before the latter is applied. There is no contraindication,

however, to simultaneous vaccination against yellow fever, tetanus and the enteric diseases.

Since the attenuated virus is extremely labile and readily becomes inactivated at ordinary temperatures, great care must always be taken to keep the vaccine at a temperature not higher than 4°C. Any diluted vaccine that has stood longer than three hours at room temperature must be discarded.

The vaccine in recent years has been administered without serious consequences to over 2,000,000 persons in South America and elsewhere under the supervision of the Rockefeller Foundation.

Cholera and Plague

In special instances, cholera and plague vaccines are used. Troops or naval forces about to enter areas where cholera is endemic or epidemic or where there is a serious threat of exposure to bubonic plague are given the appropriate vaccine. The cholera vaccine consists of 8,000,000,000 killed vibrios per cubic centimeter. The organisms are derived from a recently isolated strain, which should tend to ensure good immunizing properties. The suspension is injected subcutaneously in doses of 0.5 and 1 cc. at an interval of seven to ten days. In contrast, the plague vaccine available, at least until recently, is made from old stock strains, and accordingly, its antigenic potency is open to considerable question. Until we have a better preparation, this material, which contains 2,000,000,000 organisms per cubic centimeter, is being employed and is administered in the same manner as the cholera vaccine. Up to the middle of last February, the Army had received no reports of untoward reactions following the injection of either preparation.

Everyone is aware that the efficacy of these vaccines is still in doubt. Although the experience of the British and East Indians with cholera vaccination and that of the Plague Commission with prophylaxis against plague in India strongly suggest that such procedures tend to decrease the incidence of both diseases, as well as to lower the mortality, it is as yet impossible to place as much confidence in them as we do in smallpox vaccination and the others that I have mentioned. Research by certain groups in this country with the object of obtaining better products is being actively pursued.

Typhus

Some allusion, perhaps, to vaccination against typhus fever of the classic or European variety is appropriate. The prospect of the entrance of our forces into regions where this disease is endemic or epidemic makes vaccination highly desirable. A suitable preparation was believed to be at hand in the Cox[10] yolk-sac vaccine. This, indeed, was used for a time in the Army and Navy. Tests, however, of its effectiveness as an antibody stimulant were disappointing, and its use has been discontinued. Vaccines prepared by different technics, however, are available and are under investigation. Of these I shall mention only one, since I have firsthand knowledge of it.

This vaccine, devised in the bacteriological laboratory at the Harvard Medical School, consists of a suspension of killed rickettsias of the European type. The organisms are obtained from mice whose resistance to infection has been reduced by preliminary heavy exposure to x-rays. Experiments with guinea pigs and cotton rats have indicated that the material induces satisfactory immunity. Moreover, the serums of a small group of human beings, drawn from two to six weeks after a series of injections, have been shown to contain considerable amounts of antibody, which is capable of protecting both guinea pigs and cotton rats against a number of infecting doses of living rickettsias. The disadvantage of the method for large-scale production lies in the necessity of using the x-ray treatment and many thousands of mice. Should it be found desirable, however, to produce vaccine in this manner, I believe means could be found to circumvent such practical difficulties.

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WORLD CONFLICT AND MEDICAL SERVICE*

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CHICAGO

WE are at war! Slowly, it is seeping into our consciousness that it is a new kind of war in a new kind of world; that it is of such scope and of such proportions that no single human intellect can comprehend — even remotely — its final implications.

We shall win this war. It may be months long or years long, but, ultimately, the eternal verities for which we wage war will emerge triumphant. There are in prospect months, many months, of toil such as we have never known; sacrifice such as we have never imagined — tears and sweat and blood and heartbreak.

There can be no question concerning the deadliness of the peril or the necessity for unlimited sacrifice and undivided devotion. American medicine is trained in service — it is now steeling itself to its part of the gigantic task that lies ahead.

In October, 1941, the Procurement and Assignment Service was formally authorized as a governmental agency. The mechanisms and functioning of this vital, all-professional agency, headed by Dr. Frank H. Lahey, a distinguished member of your society, have been fully explained. Suffice it for me to say that physicians are beginning to understand that to meet the developing necessity every doctor and every medical student will be called on to contribute to the extent of maximum individual capacity. American medicine will make — already is making — its vital contribution without question — without qualification — without reservation.

Two phases or aspects of the operation of the Procurement and Assignment Service, however, should receive special consideration. A comparison should be made. Day by day, as moves were made to convert our production facilities, our resources, our manpower to make them available for an all-inclusive, all-out effort for total war, it became progressively more essential to establish arbitrary and effective controls. Our automobile industry has ceased to exist. Tires are not purchasable. We are becoming accustomed to cuffless trousers and rubberless girdles. Sugar is rationed. And it is fully understood that these are merely the beginnings of the establishment of controls that, eventually and quickly, will apply to all essential supplies. Each processor of goods in the United States must secure his raw materials through a constantly tightening system of priorities. He is told what materials he can have, how much of them can be provided, how they must be utilized and what disposition shall be made of the finished product. There is no complaint. It is accepted that such steps and such controls are essential to the effort that must be made.

This is the significant and truly important fact. In this country we have now progressed to the point where the medical, dental and veterinarian professions — under the Procurement and Assignment Service — are the only nation-wide groups that operate on the basis of self-administration and self-discipline. In all likelihood, the establishment of this service on such a basis is the greatest achievement of and the greatest tribute ever accorded to these professions in the United States. It should be accepted on this basis — and physicians should see that their portion of it functions with such effectiveness that compulsory controls are rendered unnecessary.

That is the first phase. Organized medicine is one of three nation-wide groups — vital to the war effort — that have retained their autonomy, which is self-administering and self-disciplining.

The second phase is that of the elements of danger involved. Almost without exception, the leaders of medical organizations — the trustees of the American Medical Association, the members of the House of Delegates and the presidents, secretaries and other officers of state medical societies — make up the organization that carries on the all-important task of the procurement and assignment of physicians. It is expected that 40,000, possibly 50,000 physicians will be called to serve with the armed forces.

For a quarter of a century, to an ever-increasing degree, American medicine has been conscious of the threat of so-called "socialized medicine" — more accurately defined as state medicine or the political control of medical practice. It must be kept in mind that, if the war continues two or more years, with ever-deepening intensity, with a constantly accumulating need for devotion and sacrifice, which is to be expected, we shall have established the machinery and possibly may have developed the habit of providing for the distribution of medical care through an agency of government.

Under these conditions, medicine must remember — must be made to remember — the funda-

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†Executive administrator, National Physicians Committee for the Extension of Medical Service.

mental factors that are responsible for its present place of pre-eminence. Its scientific achievement, its technical effectiveness, its capacity to anticipate this great emergency need, its ability to make the contribution it has made and will make in war effort are the result of conditions and principles under which it has been permitted to function.

The basic tenet of American medicine has been that where there was disease a life was the issue. It mattered not whether prince or pauper was involved. If we are to make progress, this principle must be preserved and sanctified. The whole of men's concepts are in flux. This basic tenet may be lost or sacrificed unless we make a task of preserving it. This is the first part of an essential wartime task of the medical profession. It in no way militates against or in any way detracts from our contribution toward winning the war. It is of the most vital importance if we are to preserve the form and pattern of medical practice and the independence of the profession.

There is a second part to this really grave responsibility of the medical profession. It is of equal, possibly of greater, necessity that the general public be kept conscious of the general superiority of American medicine and of the greater relative effectiveness of our system of distribution of medical care.

In a very real sense, this is a function of the National Physicians' Committee for the Extension of Medical Service. It is my hope that I may leave with you a definite and lasting understanding of the "why" and the method of functioning of this all-physician organization — the National Physicians' Committee. In the short time allotted, in all likelihood, this can be done most effectively by illustration. As a case in point — each week, every week, an editorial service is provided for more than twelve thousand weekly newspapers throughout the United States. Keep in mind that it is essential that the public understand what it — the public — has to gain or lose by substituting a political control of medical care for our system of independent medicine.

Always these editorials deal with health matters of current interest. The following are typical titles: "No Mass-Production Doctors"; "Science Must Know"; "The Eternal War"; "The War Against Disease"; "Socialism Doesn't Insure Health"; "Science and Freedom." Each editorial has a short, final paragraph dealing with the relative effectiveness of American medical service and our system of the distribution of medical care. For example: "The doctor is a soldier — a soldier fighting an everlasting war against disease and plague and death. Today medicine is mobilized to make that fight even more effective." Another last paragraph: "Private medicine has made strides that can be best described as miraculous in controlling and eliminating the great bacterial killers. The final result is twofold — longer lives for the people and happier, fuller lives as well." Another: "We Americans have more doctors and better doctors than any other nation. We Americans, rich or poor, receive in sickness far finer care than any other human beings. That is the way the system of private medicine proves its soundness — by its final results." Another: "In this country, the level of public health is the highest ever attained in the civilized world. But even that great achievement doesn't satisfy the medical men. They mean to achieve far more in the years to come. That is the way the medical mind works. It never stands still. It must always look forward." One more last paragraph: "American doctors oppose political tinkering in the field of medicine which would in all probability make for retrogression, not progress, in medical science."

To illustrate more concretely the purpose and the method: on February 4, 1942, — note this date, approximately two months after the treacherous attack on Pearl Harbor, — the Council of the Massachusetts Medical Society unanimously adopted a vitally important resolution in connection with proposed amendments to the Social Security Act. In part, the resolution reads:

> WHEREAS, It seems to be the intent of this legislation to finance this extension, in the case of the employed, by a tax of 1 per cent on payrolls, one half of which is to be paid by the employer and one half as a deduction from wages; . . .
>
> WHEREAS, The people of these United States are now heavily burdened and will be further burdened by our war effort;
>
> WHEREAS, This is the first step in the direction of the complete control of the care of the sick by Government; and,
>
> WHEREAS, Wherever such control has existed the quality of medical care has suffered; therefore, be it
>
> RESOLVED, That the Council of the Massachusetts Medical Society in regular session, February 4, 1942, does hereby oppose any such extension of the present Social Security Law as is herein outlined.

In connection with these same legislative proposals, the March 7 issue of the *Journal of the American Medical Association* carried a 2500-word editorial. I quote one short paragraph:

> The American people are not averse to immense sacrifice — even to the ultimate sacrifice — if it will win the war. They should not be compelled, in the midst of such sacrifice, to consider radical proposals for changing the whole system of American living in health or in illness. The proposed expansions of the Social Security Act related to medical care should be considered in times when they can be given that type of

deliberate, meticulous consideration which carefully weighs every aspect of the problem concerned. Such proposals should not be submitted to the Congress and to the people in a period fraught with anxiety as to whether or not the nation itself will survive.

In this manner, clearly defined policy was established.

On March 23, the National Physicians' Committee provided its more than twelve thousand newspapers — with an estimated forty million readers — with an editorial, entitled "No Time for Wasteful Debate." It stated, in part, "It has been proposed that the Social Security laws be broadened in order to establish what would amount to a nation-wide system of compulsory sickness insurance." It quotes the above paragraph from the *Journal of the American Medical Association* and closes with this sentence, "This is certainly no time for debating a proposal which would take us a long way toward regimented, Europeanized, politically-dominated medicine."

On March 30, a second editorial, entitled "Not the Time," was provided for these forty million potential readers. The first and last two sentences of the editorial were as follows: "A definite campaign is underway to extend the Social Security Act to an extent never intimated when it was passed — and to an extent which would work a revolutionary change in American life." "This is not the time to dislocate a system of medical care which has produced such fine results. This is not the time to distract the attention of the people and the Congress with proposals which have no bearing on the incredibly difficult job of winning a war which comes ever closer to our own territorial borders."

On April 6, a third editorial was published. I quote the opening and concluding sentences: "While war news grips the headlines and the attention of the people, a movement is underway that would regiment the practice of medicine in this country." "This is not the time to debate a measure which would tend to make medical care a definite province of centralized government."

There was one more step in this systematic, continuing process. On March 24, the National Physicians' Committee was accorded the facilities of the approximately sixty radio stations comprising the Mutual Network for a fifteen-minute nation-wide broadcast. I quote from this broadcast:

> American medicine believes that, at this time, there dare not be a division of effort. American medicine believes — and demonstrates its belief with deeds — that the war effort must be prosecuted with an unswerving singleness of purpose that will leave nothing to chance.
>
> Now, unfortunately, there has been forced into this truly perilous situation legislative proposals which, if enacted into law, will take the first steps toward nullifying the most sacred and basic concepts of the medical profession. Medicine, for itself, seeks nothing. Medicine asks for nothing save the preservation of conditions which enable physicians to apply their science and their skills to the best possible advantage. In the settlement of this grave issue the public has much to gain — with the alternative, the prospect of irreparable loss.

The broadcast quotes President Roosevelt on medical policy; it quotes the editorial in the *Journal of the American Medical Association*; and it concludes:

> Eventually, after the war is won and the final victory is a reality, this vital issue can be reconsidered. If eventually some form of compulsory health or hospital insurance results — American physicians will accept the decision with a foreknowledge of its hampering, stultifying effect. For the time being, American physicians believe that there is one issue — now — winning the war.
>
> This issue has been raised and must be met. It is not a matter of any selfish interest of the physicians of the United States. In a literal sense it is a matter of life and death. It directly affects one hundred and thirty million people who tomorrow or next week may be stricken with disease. At any cost, compulsion — any compulsion — should be avoided in the relationship between the patient and his physician. Tomorrow you may lunch with a friend — talk to him or her about this issue. You are a member of a club — make compulsory insurance the subject matter of discussion. Do this and you will do much — the one desire of American medicine is that the issue be really understood.

These circumstances have provided an opportunity for a concrete demonstration of the functioning of the National Physicians' Committee. There will be irreparable loss — if we fail to keep constantly in mind the fact that in the final analysis, *the public's opinion of the quality and effectiveness of medical service will become the deciding factor in the settlement of the problem*. They cannot know what it is, how it works, and of its relative effectiveness unless they are told. It has become definitely the responsibility of medicine to keep the public informed. In this instance, it was possible for the National Physicians' Committee to take the policy decision of the Council of your society and make it available to more than twelve thousand newspapers with nearly forty million readers and to carry the same message to hundreds of thousands, possibly millions, of radio listeners.

The first paragraph of the first document (*The Achilles' Heel of American Medicine*) ever published by the National Physicians' Committee reads:

> The weak spot in American Medicine is in its singleness of purpose. Its greatest danger lies in the exclusiveness of its devotion to scientific improvement and technical effectiveness.

Under conditions now prevailing, the urge to the "limit of capacity service" is irresistible. *Today*,

American Medicine's greatest danger lies in the possibility of refusing or failing to keep in mind medicine's fundamental concepts during a period of abnormal crisis.

On this basis, the importance of the activities of the National Physicians' Committee has been multiplied greatly. Physicians must be made to keep in mind the fundamental factors responsible for its past achievements and its present unequaled effectiveness. The public — one hundred and thirty million people — must be kept aware of the fact that through our system of private medicine they have been the beneficiaries of the most effective and most widely and evenly distributed medical care that has ever been provided anywhere at any time. During the period of this greatest emergency, this is the primary function of the National Physicians' Committee.

During recent weeks, — since Pearl Harbor, — strong supporting committees have been organized: in Chicago, through fifteen branch societies; in Altoona, Lancaster, Williamsport and Philadelphia, Pennsylvania; in New York City — the Bronx, Richmond and Brooklyn — and in Buffalo, Rochester and Syracuse, New York. Many state societies have adopted resolutions providing for state-wide co-operation. It is hoped that with your commendation, the Council of your society may take official action in connection with approval of and support for the continuing work of the National Physicians' Committee, in order that during this trying period, when the necessity for controls is accepted and when regimentation is approved, we may be kept on the alert and constantly conscious of the elements of independence of action that are responsible for our past progress and our incomparable achievements.

Pittsfield Building

MASSIVE HEMATURIA OF RENAL ORIGIN*

GEORGE C. PRATHER, M.D.†

BOSTON

UNLESS one is aware of certain circumstances in medicine through personal experience or the experience of others, it is possible to arrive at false conclusions even when apparently sound reasoning has been used in formulating an opinion. As an example, profuse urinary-tract hemorrhages not infrequently occur from the necrotic or traumatized surface of a bladder tumor or from large, distended veins on the surface of an enlarged prostate; such hemorrhages are severe enough to fill and distend the bladder with blood and blood clot, and to cause acute urinary retention.

A hemorrhage of this magnitude from a renal lesion indicates that considerable blood has passed down the ureter to the bladder. If one remembers the physiology of renal and ureteral pain, the possibility for such a quantity of blood to pass down the ureter without causing renal pain owing to interference with drainage from the corresponding kidney seems rather remote. Yet the cases presented below demonstrate that renal bleeding sufficient to fill the bladder with blood and clots can occur without causing any discomfort in either kidney region.

In cases of severe urinary-tract hemorrhage without symptoms referable to the kidney region, there is always a temptation to open the bladder through a suprapubic incision, under the delusion that the cause of the hemorrhage may well be found in the bladder or prostate. Knowledge that renal bleeding can produce an alarming collection of blood in the bladder without any symptomatic indication of the source of the hemorrhage should cancel this temptation, however, and should enjoin evacuation of the bladder through a rigid catheter, cystoscope or resectoscope, rather than by an exploratory incision. The endoscopic evacuation of the bladder should provide a medium sufficiently clear to permit observation of the ureteral jets or catheterization of both ureters, unless, of course, the source of the hemorrhage can be observed in the bladder or prostatic urethra.

The task of freeing the bladder of all clot is not always a brief or pleasant one. Not infrequently, an hour is spent in this procedure before a thoroughly satisfactory view of the bladder is obtained. For emptying the bladder of clot and blood in the circumstances under discussion, I have employed the sheath of either a No. 24 Fr. cystoscope or a resectoscope. Either the Ellik evacuator or a Janet type of syringe (glass barrel with steel plunger) can be attached to the distal end of these sheaths for alternate irrigation and suction. With the help of preliminary narcosis and local anesthesia, most patients can be handled without spinal or general anesthesia, although I see no objection to anesthesia for the procedure if the patient does not tolerate the maneuver with local medication.

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After the bladder has been freed of its bloody content, cystoscopic observation usually reveals a bladder mucosa that is dull red, light absorbing, and lacking in normal luster. Following the inspection of the bladder itself for evidence of tumor, ulceration or other disease, it is advisable to watch the contractions of the ureteral orifices before they are catheterized. With severe bleeding from one kidney, careful observation of the ureteral orifices should disclose which kidney is at fault before the ureteral catheters are inserted. With this knowledge before catheterization of the ureters, the uncertainty of whether bloody urine draining from the ureteral catheter is due to true renal disease or the trauma of insertion is avoided. Catheterization of both ureters is desirable not only to provide pyelographic data of the bleeding kidney but also to demonstrate the integrity of the opposite one, should immediate removal of the diseased organ be deemed necessary.

Correct interpretation of the pyelogram of a bleeding kidney is notoriously difficult because of filling defects, which may be due to a blood clot in the kidney. However, the information obtained at the time of the emergency cystoscopy is essential either for a prompt diagnosis or for comparison with pyelographic data that might be obtained at a later date.

The immediate treatment naturally depends on whether prompt surgery seems to be necessary as a lifesaving measure to stop the hemorrhage or whether, after the bleeding has ceased, operation may be postponed until the problem has had further study and consideration. The general condition of the patient, the probable diagnosis and the state of the opposite kidney determine the appropriate treatment.

Case Reports

Case 1. W. G. (B.C.H. 983942), a 30-year-old man, was first admitted to the hospital on March 30, 1940, because of gross hematuria of a month's duration. Four days before admission, the hematuria became severe, and the patient passed large blood clots in the urine. There had been no pain in the kidney regions, but he described discomfort in the lower abdomen.

The past history was not significant, but the family history indicated exposure to tuberculosis in the household.

Physical examination disclosed no gross abnormalities except for the abdominal findings, which were those of a distended, tense bladder easily visible and palpable. The upper border of the bladder was at the level of the umbilicus. The whole lower abdomen was tender to palpation.

Laboratory data showed a red-cell count of 4,480,000 with a hemoglobin of 100 per cent, and a white-cell count of 8300. The nonprotein nitrogen was reported as 32 mg. per 100 cc. of blood.

An x-ray film of the chest was negative for tuberculosis.

Shortly after admission, the patient was catheterized, and the bladder evacuated of grossly bloody urine with a moderate number of clots. He was left on constant drainage, and the hematuria disappeared spontaneously during the following 48 hours.

On April 5, cystoscopic study showed the left side of the bladder to be edematous, in addition to a small ulcer in that region. The mucous membrane of the remaining portions of the bladder revealed diffuse inflammation. The left ureteral orifice was deformed by edema and inflammatory changes. Both ureters were catheterized for specimens, and indigo carmine appeared from both ureteral catheters in 2½ minutes following intravenous injection. Intravenous pyelograms were obtained (Fig. 1).

Figure 1. *Intravenous Pyelogram.*

There is an ulcerative lesion of the middle calyx of the left kidney. The lower left ureter shows an irregular dilatation.

A provisional diagnosis of left renal tuberculosis was made, and the patient was discharged from the hospital on April 10, pending report of guinea-pig studies of the kidney specimens.

The patient was readmitted on May 20, following autopsy of the inoculated guinea pigs, which indicated that the left kidney was positive for tuberculosis. On May 24, left nephrectomy was done through a lumbar incision. The kidney was easily exposed and delivered, and the ureter was ligated, bisected and tied approximately 10 cm. below the kidney pelvis. The pedicle was clamped, the kidney was removed, and the pedicle was securely tied. The wound was closed with a Penrose drain to the renal fossa. Convalescence was uneventful.

The pathological report described the weight of the left kidney as 120 gm.; several small, yellowish areas were scattered throughout the pyramids, pelvic mucosa and calyxes. The microscopic diagnosis was tuberculosis of the kidney (Fig. 2).

On follow-up examination 1 year later, the wound was well healed, and the patient in good health.

CASE 2. J. D. (B.C.H. 967915), a 64-year-old man, was first admitted to the hospital on January 11, 1940, for acute urinary retention and gross hematuria. He had experienced urinary retention twice, but each time had resumed voiding after catheterization. He had recently passed grossly bloody urine and clots, but he had been unable to void for several hours prior to admission. At no time did the patient have any pain in the kidney regions.

Physical examination disclosed no pertinent physical findings except a distended bladder easily visible and palpable in the lower abdomen. There was no mass or tenderness in either kidney region. On rectal examination, the prostate showed benign enlargement.

Laboratory studies disclosed a red-cell count of 2,600,000 with a hemoglobin of 50 per cent and a white-cell count of 16,400. The nonprotein nitrogen was reported as 35 mg. per 100 cc. of blood.

The patient was catheterized and placed on constant urethral drainage. Grossly bloody urine, with clots, was

FIGURE 2. *Tuberculosis of the Kidney.*

This low-power photomicrograph of a section of the left kidney shows a large area of caseous necrosis, with tuberculous granulation tissue on the periphery.

obtained. On drainage, the urine remained somewhat bloody. Cystoscopy on January 14, 3 days after admission, still showed a quantity of bloody urine in the bladder, which was evacuated through the cystoscope. When a fairly clear medium could be established, it was thought that the patient probably had a malignant tumor on the posterior bladder wall, which obscured satisfactory vision of the bladder base and trigone. Neither ureter was catheterized, and no pyelographic studies were done. Following this examination, hematuria did not cease, and the patient's general condition was only slightly improved by two blood transfusions.

On January 20, a suprapubic cystotomy disclosed a very large blood clot and foul urine in the bladder. Intravesical enlargement of the prostate was observed, but no bladder tumor could be identified. A suprapubic tube was placed in the bladder, and the wound closed. Following the operation, lack of improvement was evident. The patient became septic, his general condition declined, and he

FIGURE 3. *Bilateral Retrograde Pyelogram.*

The lower calyx of the right kidney is shortened and partially obliterated.

expired about 6 weeks after operation. There is no indication on the record concerning whether or not the drainage remained clear.

At autopsy, the right kidney weighed 500 gm., and on microscopic section the upper pole was occupied by a tumor measuring 6.0 by 10.0 by 6.5 cm.; the grey-red tumor extended into the pelvis and obstructed the ureter at its origin. More of the tumor could be seen in the veins and arteries of the kidney. The bladder mucosa was of increased thickness and red grey, but no tumor of the bladder could be demonstrated. The diagnosis was carcinoma of the right kidney.

CASE 3. M. C. (B.C.H. 978178), a 38-year-old man, was admitted to the hospital on April 6, 1940, with the diagnosis of acute urinary retention and gross hematuria. His general health had been good. The patient had experienced no urinary symptoms until 24 hours before admission, when he noticed blood in the urine. The hematuria continued with the passage of some clots. A few hours before admission, he was unable to pass any urine. His physician was called, but since an attempt at catheterization failed, the patient was referred to the hospital. There had been no complaint of pain in either kidney region.

Physical examination disclosed no pertinent findings except for examination of the abdomen, where a distended

bladder was easily visible and palpable. There was no tenderness or enlargement in either kidney region.

Laboratory studies revealed a red-cell count of 4,700,000 with a hemoglobin of 80 per cent, and a white-cell count of 12,300. The nonprotein nitrogen was reported as 23 mg. per 100 cc. of blood.

The patient was catheterized easily with a soft catheter, bloody urine and a blood clot from the bladder being evacuated.

Cystoscopy 2 days later showed the bladder mucosa to be red and edematous. Both ureteral orifices were

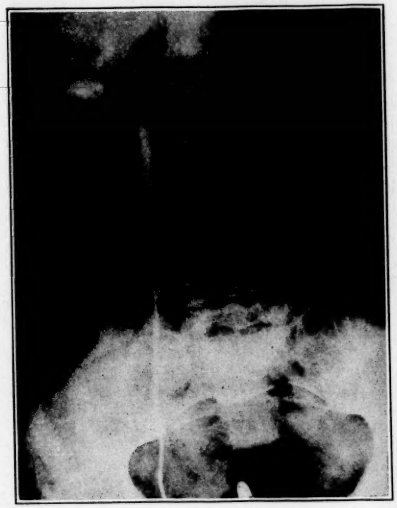

FIGURE 4. *Right Retrograde Pyelogram.*

The filling defect in the upper right ureter is due to blood clot. The lower calyx of the right kidney is distorted.

edematous, and dark urine could be seen coming from the left ureteral orifice. On the left lateral wall of the bladder, a small ulcer was visible. Both ureters were catheterized, specimens were obtained from each kidney, and a retrograde pyelogram was done. The pyelographic report indicated a filling defect 2.5 cm. in diameter involving the renal pelvis and superior calyx; this was thought to be tumor rather than blood clot.

On April 16, a left nephrectomy was performed through a left lumbar incision. The upper pole of the kidney was irregular and cystic to touch.

Pathological study of the removed kidney showed one entire pole to be cystic. In addition, there were five small, yellow nodules protruding from separate areas on the surface of the renal cortex. The microscopic diagnosis of the removed kidney was renal tuberculosis and chronic pyelonephritis.

Convalescence was uneventful, and the patient was discharged to a sanatorium on May 4. He was discharged from the sanatorium in good condition approximately 6 months later.

CASE 4. F. D. (private patient), a 64-year-old man, was admitted to a hospital on February 20, 1941, because of gross hematuria, which had begun 2 days previously. Several hours after he first noticed hematuria, it became difficult for him to pass any urine. His physician catheterized him, irrigated the bladder free of clot, and sent him to the hospital. At no time had the patient noticed discomfort in either kidney region. On arrival, he was comfortable and voided amber-colored urine easily.

The past history was irrelevant.

Physical examination disclosed no gross abnormalities. The blood pressure was 140/82. Abdominal palpation revealed no mass or tenderness. The bladder was not palpable or percussible. The external genitalia were nor-

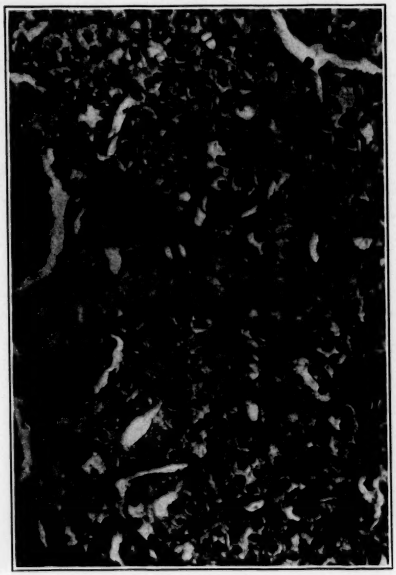

FIGURE 5. *Renal-Cell Carcinoma.*

This section through the more compact portion of the tumor in the right kidney shows the tubular arrangement of the cells with only a moderate degree of vacuolization. The scantiness of the stroma is marked.

mal, and by rectal examination the prostate was normal in size and consistence.

Cystoscopy and a pyelogram were done the day following admission. The bladder appeared normal in all respects. No intravesical enlargement of the prostate was

noted, both ureters were catheterized easily, and clear urine drained from both kidneys. Good function of both kidneys was demonstrated by intravenous phenolsulfonephthalein. A bilateral pyelogram was taken. The pyelographic report failed to describe any dilatation or abnormality of the kidney pelves or ureters (Fig. 3).

Following cystoscopy, the patient voided clear urine for 36 hours, and suddenly he passed a large quantity of blood and blood clot through the urethra. Within ½ hour, the bladder became distended with blood clot. At cystoscopy, over 700 cc. of blood and bloody urine was removed from the bladder by suction and irrigation through the cystoscope. After thorough washing of the bladder, it was possible to visualize a long, stringy blood clot protruding from the right ureteral orifice. The right ureter was catheterized without difficulty, and a pyelogram made (Fig. 4). This second pyelogram of the right kidney showed an apparent enlargement of the lower pole of the kidney that had the appearance of tumor.

On February 23, immediately after cystoscopy, a right nephrectomy was performed under spinal anesthesia through a right-flank incision. The kidney contained a large, solid tumor at its lower pole. Intravenous glucose and a blood transfusion were given at the conclusion of the operation.

The pathological report of the excised kidney disclosed primary carcinoma of the kidney (Fig. 5).

Convalescence was uneventful, and the patient was discharged from the hospital on March 14.

Following discharge, he had a program of deep external radiation, which was completed on June 20. So far, his health has remained good, and there has been no clinical evidence of recurrence of tumor either in the wound or at distant points.

Cases 1, 3 and 4 illustrate what is, I believe, the proper handling of the problems they present. Case 2 shows clearly the error that can easily be made — that is, interpreting blood clot in the bladder as evidence of bladder disease and proceeding with bladder surgery when the cause of the bleeding is a renal lesion.

Conclusions

Bleeding sufficient to fill the bladder with clots and cause acute urinary retention may be due to a renal lesion. The passage of a large quantity of blood from the kidney to the bladder can occur without causing discomfort in the kidney region or giving any clinical symptoms indicative of the source of bleeding.

If errors in treatment are to be avoided, careful evacuation of clot by endoscopic means must be done, and the source of the bleeding must be demonstrated. Occasionally, prompt nephrectomy is necessary as a lifesaving measure to avoid fatal hemorrhage.

99 Commonwealth Avenue

CLINICAL NOTE

DETERIORATION OF MILK BY BACTERIAL GROWTH UNDER REFRIGERATION AT 40°F.*

FRANK E. MOTT † AND HENRY MAZER ‡

BOSTON

IN consideration of the possible effect of the adoption of delivery of milk every other day by dealers in Metropolitan Boston, it appeared desirable to ascertain what the change in the bacterial content of milk might be from day to day in a modern refrigerator at 40°F.

Such a study was undertaken, and the original investigation included Grade A milk-pasteurized, commonly called "Grade A milk," and Grade B milk-pasteurized, commonly called "milk-pasteurized." At the request of the Medical Milk Commission of Boston, Incorporated, the investigation was enlarged to include certified milk-pasteurized, produced under the supervision of the commission. The samples of milk were obtained from vehicles on the streets of Boston engaged in the delivery of milk during the period, March 3 to May 10, 1942. Table 1 shows the results of the study.

The colonies of bacteria were counted by the standard plate method of the American Public Health Association, with the plates incubated at 32°C.; the numbers listed are the arithmetical averages, which were used purposely so that the important effect of the lack of uniformity might not be lost.

After seventy-two hours in the refrigerator at 40°F., both Grade A milk-pasteurized and Grade B milk-pasteurized had such a growth of colonies of bacteria from 1 cc. that their sale would be in violation of the law and standards of the Commonwealth of Massachusetts, which have been adopted for the protection of public health.

Certified milk-pasteurized, on the other hand, even after ninety-six hours in the refrigerator, still conformed to the bacterial standards and was perfectly safe for use as measured by present knowledge of the subject. After four days in the refrigerator at 40°F., both Grade A milk-pasteurized and Grade B milk-pasteurized had bacterial contents so great that their use might reasonably be expected to cause diarrhea and enteritis in children under six years of age.

To estimate the effect on bacterial growth of shutting off the refrigerator and the ensuing gradual rise in temperature, in one group of experiments the refrigerator was turned off at the end of the second day, and samples of milk were taken then and at the end of the third day, when the temperature had risen to 53°C. The results are presented in Table 2.

Both Grade A milk-pasteurized and Grade B milk-pasteurized had undergone such an increase in bacterial growth that their use might have caused diarrhea and enteritis in young children.

TABLE 1. *Growth of Colonies of Bacteria from a Cubic Centimeter of Milk.*

TYPE OF MILK	NO. OF SAMPLES		NO. OF COLONIES ON DELIVERY	1 DAY AT 40°F.	2 DAYS AT 40°F.	3 DAYS AT 40°F.	4 DAYS AT 40°F.	5 DAYS AT 40°F.
Certified-pasteurized	22	Maximum	20	40	100	850	1,000	1,400
		Minimum	0	4	5	8	15	20
		Average	8	14	44	157	286	770
Grade A-pasteurized	12	Maximum	700	4,000	20,000	200,000	650,000	5,500,000
		Minimum	100	150	200	300	2,000	5,000
		Average	300	1,300	4,300	110,000	190,000	1,300,000
Grade B-pasteurized	12	Maximum	15,000	26,000	65,000	130,000	500,000	8,000,000
		Minimum	2,000	2,000	2,000	3,000	4,000	20,000
		Average	6,000	9,600	15,000	41,000	130,000	1,700,000

TABLE 2. *Growth of Colonies of Bacteria from a Cubic Centimeter of Milk before and after Stopping Refrigeration.*

KIND OF MILK	AVERAGE NO. OF COLONIES AFTER 2 DAYS AT 40°C.	1 DAY LATER (53°C.)
Certified-pasteurized	100	300
Grade A-pasteurized	5,000	540,000
Grade B-pasteurized	10,000	100,000

But certified milk-pasteurized conformed to the bacterial standards adopted for that grade of milk, and was still perfectly safe to use as measured by present standards.

In view of these findings, it is evident that the present conception of the inhibiting effect of refrigeration on bacterial growth in milk must be revised.

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MEDICAL PROGRESS

DIABETES MELLITUS

ELLIOTT P. JOSLIN, M.D.,* AND HOWARD F. ROOT, M.D.†

BOSTON

STATISTICS

FOR 1939, the death rate for diabetes in the registration area of continental United States was 25.5 per 100,000, but in 1940 it rose to 26.6, with 35,015 deaths, the highest figures yet recorded. In 1941, however, there are indications from various sources that this upward rise is reaching a peak and that the deaths from diabetes have begun to decline from the previous rate. Thus, among the 17,000,000 industrial policyholders of the Metropolitan Life Insurance Company, the diabetic mortality rate in 1940 was 29.5, and in 1941, 26.8 per 100,000. Similarly, drops, ranging up to 18 per cent, occurred in the reported rates for 1941 compared with those for 1940 in New York City (41.6 to 40.7), Chicago (38.0 to 31.1), Philadelphia (41.9 to 40.4), Boston (41.1 to 38.4) and Cincinnati (43.0 to 36.8).

The explanation of this decreasing mortality is at least threefold. In 1941, the good effects of the sulfonamide drugs became manifest in pneumonia and other infections — complications that have always taken a heavy toll of diabetic patients. Furthermore, the treatment of diabetes has steadily improved, largely owing to greater familiarity with the use of insulin and particularly to the protecting quality of protamine zinc insulin because of its prolonged action. Finally, this lengthening of life of the diabetic patient of itself, along with the better control of the disease, influences the physician, when he signs the death certificate, to minimize the importance of what is apparently the secondary cause of death — diabetes — or even omit it and register alone the actual cause, such as arteriosclerosis in its multiple manifestations, cancer, tuberculosis or similar but less frequent maladies.

The duration of life of diabetic patients is lengthening. The outcome of the first 10,000 patients (1898–1931) who consulted us on account of glycosuria has been investigated this year. The results, which have not hitherto been published, although they were cited in part at the meeting of the Association of American Physicians last May and formed part of an exhibit at the American Medical Association in June, are set forth in Table 1, in which for comparison are included data for earlier periods and also any deaths that were known among patients seen after 1931. These data are based on 6596 fatal cases that were seen up to and including April 20, 1942.

Fourteen and three-tenths years now represents the average duration of life of recent fatal cases of diabetes seen one or more times in this clinic, in contrast to 4.9 years, which held before June 1, 1914. This figure deserves especial recognition because 30 per cent of the patients in 1940–1942 were already sixty years of age or older at the onset of their disease. With a gain of 3.6 years of life since the period, January 1, 1930, to December 31, 1936, based on fatal cases, it is reasonable to assume that the present expectancy of life in diabetes, as compared with that computed for our living and dead patients in 1938 by the Statistical Department of the Metropolitan Life Insurance Company, has risen from two thirds to nearly

TABLE 1. *Survival after Onset in 6596 Fatal Cases of Diabetes.**

AGE AT ONSET	NAUNYN ERA — TO 5/31/14	ALLEN ERA 6/1/14 TO 8/16/22	BANTING ERA 8/17/22 TO 12/31/29	BANTING ERA 1/1/30 TO 12/31/36	HAGEDORN ERA 1/1/37 TO 12/31/39	HAGEDORN ERA 1/1/40 TO —
	yr.	yr.	yr.	yr.	yr.	yr.
0–9	1.3	2.9	2.8	7.3	11.3	8.9
10–19	2.7	2.7	3.4	7.7	8.7	13.9
20–39	4.3	4.9	8.9	14.8	16.9	18.6
40–59	7.0	8.0	9.5	12.1	14.1	15.5
60 and over	4.4	6.4	5.5	7.2	8.7	10.3
Averages	4.9	6.1	8.1	10.7	12.5	14.3

*These figures were prepared by the Statistical Department of the Metropolitan Life Insurance Company; we are particularly indebted to Mr. Herbert H. Marks and Miss Edith Haldenstein.

Reprints of articles in this series are not available for distribution, but the articles will be published in book form. The current volume is *Medical Progress: Annual, Vol. III, 1942* (Springfield, Illinois: Charles C Thomas Company, 1941. $5.00).

*Medical director, George F. Baker Clinic, New England Deaconess Hospital.

†Associate in medicine, Harvard Medical School; physician, New England Deaconess Hospital.

three quarters that of the population as a whole, and we hope that the recomputations will prove this to be true. The significance of this trend on later possibilities of diabetic patients for employment or life insurance should not escape notice. The duration of life in diabetic children with onset of the disease under ten years of age is low. It should be stated, however, that since August 7, 1922, only 68 of these children have died and that 800 are known to be alive; it is obvious that the duration of the disease in the latter will eventually prolong the average of the group as a whole.

A survival of less than five years was the rule prior to August 7, 1914; in fact, it included 66.8 per cent of all cases, but this percentage has now dropped to 13.0 (Table 2). The percentage of

TABLE 2. *Survival in 6596 Fatal Cases after Onset of Diabetes.*

ERA	SURVIVAL	
	LESS THAN FIVE YEARS	TWENTY YEARS OR MORE
	%	%
Naunyn	66.8	1.8
Allen	55.9	3.1
Banting		
Early	40.5	4.0
Late	22.5	10.2
Hagedorn		
Early	15.0	14.4
Late	13.0	19.2

patients surviving twenty years or more has risen from 1.8 in the earlier era to 19.3 today; 8.2 per cent survived even twenty-five years of the disease. There are also known to be 73 children, 71 of whom are alive, whose onset of diabetes occurred when they were under fifteen years of age and whose subsequent duration of life has reached twenty years or more.

Deaths from diabetic coma have fallen from 63.8 per cent in the Naunyn Era (1898–1914) to 3.3 per cent since January 1, 1940. Moreover, of the last 62 successive cases (October, 1940, to July 24, 1942) of proved diabetic coma, with a carbon dioxide combining power of 20 vol. per cent or below, under our immediate care at the New England Deaconess Hospital, there have been no deaths, and 12 of these patients were unconscious. Diabetic gangrene, which caused 8.5 per cent of the 1448 deaths from 1922 to 1929, was the cause of 4.7 per cent among 929 deaths from 1937 to 1940, although the average age of the patients rose approximately 8.0 years and the duration of the diabetes from 8.1 to 12.5 years.

SEASONAL INFLUENCE ON DIABETES

The *mortality* from diabetes is greater in the winter than in the summer. Dr. Herbert L. Lombard[1] proved this by computing the deaths from diabetes in the United States for a year, using the deaths from cancer as a control. Thus, in December to May inclusive, the deaths from diabetes were 16,926 and in June to November inclusive, 13,661, whereas the comparable but adjusted deaths from cancer were 15,294 and 15,293. On the other hand, season had no influence on the *onset* of the disease. For this purpose, the data were limited to the cases of children seen in our clinic; the onset in adults is uncertain whereas in children it can be somewhat more accurately assigned. The figures for the children during the winter and summer months for the different types of onset are as follows: onset indefinite, 270 in winter and 267 cases in summer; gradual, that is, within two months, 347 in winter and 336 in summer; rapid, that is, within seven days, 80 in winter and 89 in summer; and sudden, that is, in the course of twenty-four hours, 91 in winter and 91 in summer.

ROLE OF HYPERGLYCEMIA IN DEVELOPMENT OF DIABETES

Perhaps the greatest contribution to the treatment of diabetes during the last year is the demonstration by Lukens and Dohan,[2] of the George S. Cox Medical Research Institute, University of Pennsylvania, that, in cats, hyperglycemia precedes the degeneration of the islands of Langerhans and that, by overcoming it within a period of three months after the production of diabetes in this animal by injections of anterior pituitary extract, one can reverse the process in the islands and can cure the animal. Nothing has better supported the orthodox treatment of diabetes than Lukens and Dohan's experiments in the forty years since Naunyn wrote that the patient with early, but apparently severe, diabetes if treated energetically would eventually do quite well, whereas the mild case if neglected would progress unfavorably. In previous progress reports,[3, 4] reference was made to the work of these authors and to that of others, but we consider the following paragraph of repetition justifiable, because of the crucial importance of the subject from the human therapeutic point of view.

The sequence of events revealing the significant relation of the pituitary gland and diabetes brings to mind the work of Cushing and Davidoff,[5] who observed that 12 per cent of 100 cases of acromegaly had diabetes and 25 per cent showed glycosuria; this figure was later raised by Coggeshall and Root,[6] in a series of 153 cases placed at their disposal by Cushing, to 17 per cent and 36 per cent respectively. Houssay's[7] epoch-making experiments showed that the removal of the pituitary gland lessened the severity of diabetes in the

depancreatized toad, and that injection of pituitary extract into such animals made the disease worse. Evans[8] observed glycosuria following the injection of the extract of the anterior pituitary in dogs. Young[9] produced out-and-out diabetes in a dog by repeated injections of anterior pituitary extract, with demonstrable destruction of the islands of Langerhans. Best and his collaborators[10] confirmed Young's work and proved that if the injections of pituitary extract were accompanied simultaneously by injections of insulin, — or, as later shown, by fasting or a high-fat diet, — the development of the diabetes was prevented. Finally, and contemporaneously with the work at the University of Toronto, Lukens and Dohan[2] confirmed in a cat Young's original observation in a dog, but in the diabetically resistant cat it was necessary first of all to remove a portion of the pancreas, although not enough to cause glycosuria. These experiments emphasized the importance of hydropic degeneration of the beta cells as the pathologic state in the early stages of diabetes before atrophy, hyaline degeneration, fibrosis and lymphocytic infiltration occur. The studies of Lukens and Dohan confirmed Allen's[11] observation that hydropic degeneration in the partially depancreatized dog is reversible by fasting, and also by the administration of insulin (Copp and Barclay[12]). In severe diabetes, this was accomplished with insulin, and in milder cases of the disease, by a reduction in diet and, finally, by lowering the blood sugar with phlorhizin.

In their article, which deserves detailed study because it summarizes the work of the authors mentioned above and a few others, Lukens and Dohan[2] write:

> As a working hypothesis, the development of the permanent phase of diabetes may be stated as follows. The administration of pituitary extract results in: (*a*) the production and maintenance of hyperglycemia, probably by its extra-pancreatic action; and (*b*) the damage to the pancreatic islands associated with this hyperglycemia, be it as cause or effect. . . . A discussion of the possibility that injury to the islands may result from hyperglycemia must take account of two facts. These are the diminished liberation and content of insulin induced by pituitary extract and the increased production of insulin which follows elevation of the blood sugar in the normal animal. The results of Best, Campbell and Haist provide the most recent correlation between pancreatic insulin, blood sugar levels and island lesions. Regardless of the changes in insulin content, no permanent or irreversible damage to the islands has been produced by anterior pituitary treatment except when there is concomitant hyperglycemia. In addition, in the case of the cat, the high blood sugar persists after stopping pituitary extract even though the pancreatic lesions are still reversible. This suggests that hyperglycemia maintains the island damage (a vicious cycle). Stated in brief, the hypothesis that the elevation of the blood glucose is an important factor in the causation of island pathology is supported by the following general observations. (*a*) Partial pancreatectomy or pituitary extract do [*sic*] not cause island lesions in the absence of hyperglycemia, and (*b*) each leads to hydropic degeneration after hyperglycemia has been present for a week or two. (*c*) The elevation of the blood sugar by perfusion has resulted in early lesions of the islands. (*d*) The islands are restored by various types of treatment which return the blood sugar to normal levels.

These authors emphasize the need for an open mind concerning the pathogenesis of diabetes. This is because Long,[13] in New Haven, and Ingle,[14] in the Cox laboratory, found almost no hydropic change or atrophy of the islands in rats subjected to marked hyperglycemia for periods of from two weeks to several months, although such findings have been reported by Friedman and Marble.[15]

Explanation of Tall Diabetic Child and Fat Diabetic Adult

Young[16] comments on the emphasis laid by our group[17] on obesity in adults and overheight and precociousness in children as a prelude to the onset of diabetes. He cites our query — "In the child, growth is vertical; in the adult it is lateral. Is not each type of endocrinal origin?" — and proceeds to solve it in a series of experimental investigations, concluding "that a positive answer might be given to Joslin's question in terms of pancreatic-hypophysial balance."

Young refers to the first demonstration of the diabetogenic action of anterior pituitary extract in normal animals by Evans,[8] in which two puppies treated daily with a growth-promoting preparation of ox pituitary gland increased twice the weight of control animals and developed polyuria and glycosuria. The pituitary extract that Young used in the causation of diabetes in the adult dog was accompanied by a growth-promoting substance. Others have also shown a similarity in properties between the growth-promoting and diabetogenic substances. Young notes that Evans, for the growth hormone, and Houssay,[7] for the diabetogenic substance, emphasized the value of using absolutely fresh glands and carrying out all procedures at low temperatures, and he therefore considers it surprising that more cases have not been recorded of the development of a diabetic condition in puppies in which gigantism has been produced by treatment with growth-promoting pituitary extracts.

Recalling that, with the adult dog effectively treated with diabetogenic extract, eventually a refractory state developed, during which the symptoms of diabetes disappeared until the daily dose of extract was increased, Young points out the

possibility that the puppies treated with growth hormone did exhibit a transient response to the diabetogenic action of the extract but subsequently became refractory to it while retaining a sensitivity to its growth-promoting effect. In a series of experiments utilizing evidence, already furnished by Evans and by Mirsky,[18] that growth-hormone preparations induce retention of nitrogen and that this nitrogen-retaining action may be mediated by the islands of Langerhans of the pancreas, he investigated the relation between the nitrogen-retaining and pancreatropic actions of anterior pituitary extracts in permanently diabetic animals in which some islet tissue remained.

Young observed that with normal cats and normal dogs an increase in body weight is associated with induction of a diabetic condition produced by the administration of crude pituitary extract, and he points out that Ogilvie[19] presented quantitative evidence that human infants have a greater amount of pancreatic islet tissue in proportion to body weight than adults. Indeed, Langfeldt,[20] years ago, noted that partially depancreatized puppies, which had been deprived of a sufficient portion of pancreas to provide a reasonable expectation of the appearance of diabetes in an adult dog, not only were free from all symptoms of diabetes for many months after the operation but also, in some cases, showed an increase of sugar tolerance; however, the sugar tolerance eventually declined, and evidence of progressive and fatal diabetes became manifest.

Space does not allow presentation of Young's experiments in detail, but his own summary is as follows:

> When puppies are treated daily with doses of crude pituitary extract greatly in excess of those required to produce diabetes in adult dogs, they respond with an increased growth rate but do not exhibit symptoms of diabetes. When one puppy was treated daily for nearly five months it eventually became intensely diabetic, and then stopped growing despite continuation of treatment.
>
> When adult dogs that have been rendered permanently diabetic by a short period of pituitary treatment are given a single injection of pancreotropic pituitary extracts, which produces no detectable diabetogenic activity in normal adult dogs, the response may be a transitory attenuation of the diabetic condition with nitrogen retention and increase of body weight or an exacerbation of the diabetes with loss of nitrogen and of body weight; intermediate responses were also obtained. These differences in response are believed to result largely from differences in functional capacity of pancreatic islet tissue.
>
> It is suggested that an increase in body weight, associated with an increase in function of the pancreatic islets, can be regarded as neutralizing, for a time at least, the diabetogenic influence of the anterior pituitary gland. It is therefore possible that the excessive weight of the adult diabetic patient and the abnormal height of the diabetic child (White) indicate an increased pituitary function which may be of temporary duration only, and of which the diabetogenic action may be completely masked for a time by a protective increase in pancreatic isle activity, induced by the pancreotropic action of the gland. Such a condition might lead first to an increase in the mass of the body and eventually to diabetes.

Influence of Estrogens and Androgens on Carbohydrate Metabolism

The influence of the estrogens and androgens on carbohydrate metabolism in normal and diabetic animals continues to excite curiosity. Apparently, the effects observed in the intact animal are quite different from those in animals partially or wholly diabetic, and the results in human beings are rather difficult to interpret. Griffiths, Marks and Young,[21] using normal rats in fasting condition, were able to show that the administration of estriol and estradiol, like that of diethyl-stilbestrol, promotes glycogen storage in the liver, whereas estrone and testosterone do not. Parallel increases in the amount of insulin in the pancreas also occur. Similarly, Fraenkel-Conrat et al.[22] were able to produce increase in pancreatic insulin when prolonged estrinization of normal rats was carried out. They conclude that two types of evidence favor the assumption that the activity of estrogens in elevating the pancreatic insulin is due to the pituitary gland — namely, the pituitary glands of such rats, when implanted in other animals, elevate the pancreatic insulin content, whereas the glands of untreated rats do not show this activity. Moreover, estrogen, which raises the pancreatic insulin content in normal rats, does not have this effect in animals whose pituitary glands have been removed. On the other hand, when Ingle[23] administered stilbestrol to partially depancreatized rats on a constant medium-carbohydrate diet, severe glycosuria and hyperglycemia occurred in all cases. Similar results were obtained with dihydro-stilbestrol, estradiol and equilin. Also, large doses of testosterone and methyl testosterone were weakly diabetogenic. In another series of studies, Ingle[24] showed that the administration of 17-hydroxy-11-dehydrocorticosterone to normal rats that were force fed with a high-carbohydrate diet caused hyperglycemia, glycosuria and an increased excretion of nonprotein nitrogen, with atrophy of the testes and thymus gland. These results seem to be confirmed by the experiments of Long,[25] which suggest that stilbestrol behaves somewhat like the adrenocortical hormone. In the studies by McCullagh,[26] the use of methyl testosterone in rabbits produced a low-carbohydrate tolerance, whereas testosterone propionate did not lower the carbohydrate tolerance. The favorable effects of methyl

testosterone in adult diabetic patients reported by some authors has not been confirmed by others.

In reporting the clinical use of stilbestrol in 79 diabetic women in the premenopausal, menopausal and postmenopausal years, Beardwood[27] was able to reduce the insulin dosage by an average of 11 units in 36 cases. In a group of 14 patients treated with large doses of Progynon B, an average reduction of 18.3 units in insulin dosage occurred in 8 patients. He concluded that estrogenic substances cannot be considered a substitute for the well-established standard treatment of diabetes with diet and insulin, but that these special preparations had a stabilizing effect in a special group whose diabetes was very labile.

Species Differences in Diabetes Following Pancreatectomy

Species differences in diabetes following pancreatectomy have been emphasized by Mirsky.[28] The greatest rise in blood sugar is observed in cats, monkeys, man, owls, snakes, dogs and rabbits in decreasing order. Animals like the duck and the chicken, on the other hand, show almost no rise of blood sugar after pancreatectomy and, indeed, no increase in blood acetone. One might say, therefore, that human diabetes is a species diabetes differing in some respects from that observed in other animals.

Resistance to Insulin and Allergy

Resistance to insulin associated with allergy to insulin has been reported in a number of cases, but it may have greater significance than has yet been realized. It is possible that such frequent although not necessarily extreme cases of insulin resistance as occur during certain types of infection may be due really to manifestations of allergy. In 2 recent cases at the New England Deaconess Hospital, allergy to insulin was associated with insulin resistance and the occurrence of specific insulin precipitins in the blood. In one case, both asthma of long duration and an acute infection were present in a patient whose diabetes rapidly became so severe that actual, serious acidosis occurred. It is possible that the acute infection stirred up general antigenic manifestations in the body and that, as a result of this change, insulin resistance occurred. Lowell[29] reports studies on a forty-three-year-old woman who had severe urticaria following injections of crystalline and regular insulin. In this case, it was found that the patient was very resistant to ordinary crystalline insulin so that an injection of 30 units intravenously caused a slight rise in the blood sugar, followed by a fall to a point only slightly below the fasting level. On the other hand, when 30 units of insulin prepared from human pancreas were injected intravenously, a fall in blood sugar took place so rapidly that a hypoglycemic reaction occurred at the end of ninety minutes, when the blood sugar was 59 mg. per 100 cc. in contrast with the fasting blood sugar of 330 mg. However, a marked allergic reaction, which was characterized by urticaria and constriction in the throat, occurred within fifteen minutes after injection of the human insulin. Tests with mice for insulin-neutralizing antibody showed that the patient's serum neutralized crystalline insulin, because the addition of serum to insulin when injected into the mice prevented a hypoglycemic reaction; such neutralization did not occur when human insulin was used. By a passive-transfer test, it was shown that skin-sensitizing antibodies were present in repeated specimens of the patient's serum over a period of six months. It was possible to sensitize normal skin to crystalline and human insulin by the injection of serum from the patient in dilutions varying from 1:16 to 1:64.

It is clear, therefore, that allergy to insulin can exist in the absence of resistance, and that resistance can exist in the absence of allergy. In Lowell's patient, resistance to crystalline insulin but not to human insulin was present. The patient reacted allergically to both crystalline and human insulin, and skin-sensitizing antibody was present for both. The patient's serum, therefore, contained an antibody for insulin, which protected mice from a lethal dose of crystalline insulin but failed to protect against human insulin. It may be concluded that two antibodies were present in the patient's serum: an allergic antibody, which conferred sensitivity on normal skin; and an insulin-neutralizing antibody, which was capable of destroying the physiologic effect of crystalline insulin.

Hyperinsulinism in a forty-year-old man was treated successfully by Allen[30] with a diet high in carbohydrate in contrast to the diet sometimes recommended, in which a high-protein content is used in the hope that a slow liberation of carbohydrate will counteract the hypoglycemia. The patient's weight was allowed to fall from 237 to 228 pounds. The blood-sugar values after a glucose-tolerance test ranged between 41 and 51 mg. per 100 cc. Allen points out that the hyperinsulinism in any patient who can be treated by a high-protein diet must be very mild. As an incidental experiment, he tried to improve the circulation of diabetic patients with deficient arterial blood supply by the administration of Antuitrin S, without favorable results.

Respiratory Quotient and Carbohydrate Metabolism

In recent unreported studies carried on jointly by the Carnegie Nutrition Laboratory and our clinic, the results obtained after the administra-

tion of glucose to diabetic patients in acidosis and in various stages of diabetes, re-emphasize the necessity of insulin in improving the utilization of carbohydrate. Thus, patients with acidosis who were given 50 gm. of glucose by vein failed to show any rise in respiratory quotient and gave no evidence that the glucose was utilized until sufficient insulin was given. However, a rise in the respiratory quotient always followed the giving of sufficient insulin. Clinically, the central position of insulin in improving carbohydrate utilization and thereby diminishing ketosis was always confirmed. For the student of biochemistry interested in the intermediate metabolism of carbohydrate and in cell respiration, the reports in the recent symposium on respiratory enzymes should be consulted.[31]

* * *

The American Diabetes Association, in conjunction with Eli Lilly and Company, has undertaken to publish abstracts of the literature relating to diabetes. Already, two such numbers have appeared. The scope of this admirable undertaking can be judged by the statement that the number of articles reviewed in the first quarterly number was one hundred and forty-seven, and in the second, one hundred and thirty-three. *Diabetes Abstracts* is distributed to members of the association and to the principal medical libraries of the country.

81 Bay State Road

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NEW HAMPSHIRE MEDICAL SOCIETY

PROCEEDINGS OF THE ONE HUNDRED AND FIFTY-FIRST ANNUAL MEETING

House of Delegates, May 11, 12 and 13, 1942

THE House of Delegates convened at the Hotel Carpenter, Manchester, on May 11, 1942, at 7:30 p.m. with Speaker Timothy F. Rock, of Nashua, presiding.

The following members answered the roll call:

The President, *ex-officio*
The Vice-President, *ex-officio*
The Secretary-Treasurer, *ex-officio*
P. R. Hoy (alternate for Lyall A. Middleton, Plymouth)
Earl J. Gage, Laconia (alternate for Richard W. Robinson, Laconia)
W. J. Paul Dye, Wolfeboro
Francis J. C. Dube, Center Ossipee
Walter F. Taylor, Keene
Norris H. Robertson, Keene
Lewis C. Aldrich, Jefferson
Arthur W. Burnham, Lebanon
Leslie K. Sycamore, Hanover
George V. Fiske, Manchester
Deering G. Smith, Nashua
H. O. Smith, Hudson (appointed as alternate for Charles H. Cutler, Peterborough)
George C. Wilkins, Manchester (appointed as alternate for Clarence E. Dunbar, Manchester)
Luther A. March, Nashua
William P. Clough, Jr., New London
Clinton R. Mullins, Concord
Warren H. Butterfield, Concord
Frederick S. Gray, Portsmouth
Anthony E. Peters, Portsmouth
Louis C. Theobald, Exeter
Albert E. Barcomb, Farmington
George G. McGregor, Durham
Bernard P. Haubrich, Claremont
Addison Roe, Newport
Richard E. Wilder, Whitefield (alternate for Leander P. Beaudoin, Berlin)

The Speaker declared a quorum present, and appointed the Credentials Committee as follows: Drs. Fiske (chairman), McGregor and Roe. Dr. Fiske reported that the credentials were in order.

The Speaker appointed the Committee on Officers' Reports as follows: Drs. Sycamore (chairman), D. G. Smith and Clinton R. Mullins. He appointed the Committee on Memorials and Communications as follows: Drs. Robertson (chairman), Aldrich and Peters. To the Committee on Nominations, he appointed Drs. Dye (chairman), Campbell, March, Clough and Gage.

Upon motion duly made and seconded, it was voted to omit the reading of the previous minutes, because of the publishing of the proceedings.

SPEAKER ROCK: Dr. Dolloff, have you anything to say to the Delegates tonight?

PRESIDENT DOLLOFF: I have a resolution that I should like to present, as follows:

WHEREAS, the House of Delegates learns with regret of Dr. Henry O. Smith's desire to retire from the Board of Trustees,

THEREFORE, BE IT RESOLVED: That the House of Delegates express to Dr. Smith its deep appreciation of his outstanding service to the New Hampshire State Medical Society in the promotion of expressed interest through his wise counsel and active participation in all its affairs during the many years of his membership.

Mr. Speaker, I move the adoption of this resolution.

This motion was duly seconded and was carried.

DR. H. O. SMITH: I can just say "Thank you."

The secretary-treasurer, Dr. Carleton R. Metcalf, presented his report.

Report of the Secretary-Treasurer

The following report for 1941 is submitted:

MEMBERSHIP, DECEMBER 31, 1941

PAID

Belknap County	34
Carroll County	15
Cheshire County	31
Coos County	36
Grafton County	72
Hillsborough County	132
Merrimack County	73
Rockingham County	58
Strafford County	32
Sullivan County	17
Not in county society	5
	505

UNPAID

Affiliate members	28	
Honorary members	10	
		38
Total		543

The total membership on December 31, 1940, was 521.

Financial Statement

RECEIPTS

January 1, 1941 — balance forward	$119.68
Belknap County	204.00
Carroll County	84.00
Cheshire County	180.00
Coos County	222.00
Grafton County	426.00
Hillsborough County	762.00
Merrimack County	450.00
Rockingham County	336.00
Strafford County	186.00
Sullivan County	120.00
Net receipts, 1940 annual meeting	248.42
Cash received at annual meeting	96.00
Receipts from members not in county societies	30.00
Receipts from trustees from General Fund	1000.00
Refund, Cancer Commission	7.43
Refund, 1940 annual meeting	7.00
Women's Auxiliaries	75.00
	$4553.53

EXPENDITURES

New England Journal of Medicine (journals)	$575.60
New England Journal of Medicine (tables)	26.60
New England Journal of Medicine (transactions)	560.34
New England Journal of Medicine (half-tone cuts)	17.48
Carleton R. Metcalf (salary)	400.00
Bridge and Byron (printing)	106.05
Envelopes and stamps	45.46
Frank J. Sulloway (committee lunches)	8.40
Eagle and Phoenix Hotel Co. (committee lunches)	8.75
Robert O. Blood (telegrams and telephone calls)	19.02
Robert O. Blood (clerical work)	150.00
Women's Auxiliary	100.00
Benevolence Fund	359.50
Florence McCann (Committee on Education and Hospitals)	20.69
The Barwood Press (Committee on Education and Hospitals)	4.50
Phaneuf Press (books)	483.14
Concord Photo Engraving Co. (half-tone cuts)	38.52
Deering G. Smith (preparedness expenses)	186.51
Deering G. Smith (dues collected at annual meeting)	42.00
Warren H. Butterfield (dues collected at annual meeting)	28.00
Leslie K. Sycamore (dues collected at annual meeting)	14.00
George C. Wilkins (cancer committee)	50.00
Carpenter Hotel (entertainment of out-of-state guests)	25.40
Manchester Country Club (expenses at buffet lunch)	955.46
Stanley B. Weld (expenses at annual meeting)	10.00
Augustus Thorndike (expenses at annual meeting)	5.00
Elmer J. Brown (expenses at annual meeting)	113.00
Deering G. Smith (expenses at American Medical Association meeting)	99.45
National State Capitol Bank (service charges)	3.00
	$4455.87
Balance January 5, 1942	97.66
	$4553.53

The Society is in good financial condition, with a balance of $97.66 on January 5, 1942. The Benevolence Fund on the same date amounted to $1385.69. Of this amount, the principal is $991.19, and the accrued income is $394.50. During the past year, we have received $75.00 for this fund from the women's auxiliaries of the following counties:

Merrimack	$35.00
Strafford	10.00
Rockingham	20.00
Coos	10.00

We gave $100.00 to the State Auxiliary to cover in part the expenses of its meeting last May.

There were two unpaid bills on January 1, 1942, owing to the fact that our expenses were heavier than usual at the one hundred and fiftieth anniversary. These bills, whose total amount was $400.08, have since been paid.

One officer and one former officer of the Society have died since our most recent meeting: Robert M. Deming, of the Committee on Tuberculosis, died on January 28, 1942, and Frank E. Kittredge, a former president, died on July 8, 1941.

The President chose Ralph W. Tuttle, of Alton, for Anniversary Chairman.

A year ago, the House of Delegates made the following recommendations, which have been carried out:

Dues were remitted for members who during any part of the year were in the Service.

The New England Medical Council was eliminated from the standing committees.

A Committee on Public Health was appointed, which has been co-operating with the State Board of Health.

The Committee on Child Health and the Committee on Maternity and Infancy have been made standing committees instead of special committees.

Fifty dollars was given to the Cancer Committee for its work.

The Committee on Public Relations and the Committee on Medical Economics conferred with Mr. Sulloway and have written an enabling act to cover the cost of medical care.

The Committee on Medical Economics conferred with the Farm Bureau about sickness insurance for farm families, but the Farm Bureau has apparently dropped the plan and has shown no recent interest in putting it into effect.

The Committee on Medical Relief has been disbanded. Its work has been referred to the Committee on Medical Economics.

Since the last annual meeting, the Benevolence Fund has received $1.00 from every member who has paid his dues.

On July 9, 1941, the Trustees removed $3000 of the Benevolence Fund from the Savings Bank and invested this amount in United States Savings Bonds. On the same date, $1000 was removed from the General Fund to pay the expenses for the one hundred and fiftieth anniversary.

Dr. Adolphe J. Provost, of Manchester, was appointed a member of the Medical Advisory Committee on Eye Diseases to co-operate with the State Department of Welfare.

I have referred to the Committee on Communications and Memorials two problems of membership. One of our elderly members has been afflicted with cerebral thrombosis and would like to become an affiliate member. He

is, however, one of five members who joined the Society before a county society had been formed in his territory. The by-laws make it compulsory for a county society to recommend a man for affiliate membership before the House of Delegates can vote on such a matter.

The other case concerns a doctor in another state who was originally a resident of New Hampshire. One of the county societies elected him an honorary member, but he desires to pay his dues. Some definite conclusion should be reached on these two cases and on similar cases that may arise in the future.

We have eleven standing committees and two rotating committees. It seems inconsistent to have the Committee on Medical Economics and the Committee on Medical Education and Hospitals rotate each year. Should not these committees be standing committees?

CARLETON R. METCALF, *Secretary-Treasurer*

On motion duly made and seconded, it was voted that the Secretary be instructed to read the communication from the Treasury Department, Bureau of Narcotics, before the Society.

Dr. Dye spoke as follows:

An agent of the Bureau of Narcotics visited the State Board of Registration in this connection a couple of days ago. I believe last year the House of Delegates decided against recommending approval of the Uniform Narcotic Act for New Hampshire, because of the amount of red tape engendered in carrying out such an act. However, it is obvious from this letter and from the report unofficially made to us by the representative of the department that the doctor is liable for all the representations that come to him in the way of dispensing narcotics.

At the moment, there is nothing in the state law that will enable the State or a federal prosecutor to hold, in the state's name, an addict who falsely obtains, by the nature of fraud or intention of fraud, a prescription for narcotics from a licensed practitioner in the State. I should like to recommend either for discussion or for a motion, as is seen fit, that the House of Delegates recommend to the State that an amendment be passed to our present narcotic law, that any person who secures a narcotic prescription from a physician, with the intent of actual fraud or intent to fraud, shall be prosecuted by the State.

I believe that would help the situation tremendously. Case after case was reported to us in which a smooth-talking person, more or less of a confidence man, would approach some member of our profession in the State and would secure from him a large narcotic prescription. This person, in turn, would go to a drug-store and purchase the narcotics. He would be apprehended by a man who represented, as an investigator, the Bureau of Narcotic Control, and found that this prescription was not necessary for him. But, according to our state law, there was nothing that the investigator could do to hold this person, who had secured a prescription by fraud. The only thing in the law would be to take some punitive measure against the physician who issued the prescription.

Therefore, the duty falls on the physician in this state, as well as the pharmacist, concerning whether anything shall be done, or any prosecution shall be made for the violation of this law.

Since we have no uniform narcotic act, and since any smooth confidence man may come into the State, get a prescription and have it filled and not be liable, we are more or less open to having many of these fraudulent addicts come here and put us on the spot, with regard to prosecutions.

Therefore, I believe that some action should be taken by the House of Delegates on this recommendation.

Dr. D. G. Smith seconded Dr. Dye's motion and stated that there are forty-three or forty-four states in which the man who obtains the narcotic or prescription is liable for prosecution. New Hampshire and Vermont are two of the states in which there is no penalty for a man coming in and obtaining a prescription. The result is that such persons are already beginning to flock into New Hampshire and Vermont, buying the morphine and taking it to Boston and peddling it there.

Dr. Sycamore asked if there were a uniform narcotic law that is recommended by the Federal Bureau.

Dr. Dye answered that a uniform narcotic act came up before the House of Delegates last year and was voted against because it entailed a good deal of red tape. It would require a full-time man in the Health Department, with much expense to the State. There would also be a considerable amount of red tape for each physician regarding making out of forms and so forth. The State Board of Health is more or less against a uniform narcotic act; it does not believe that the State is large enough to warrant such a law. It is believed that some amendment to the present law, to make persons who obtain prescriptions by fraud liable to prosecution, would be sufficient.

The President asked if that released the doctors from their responsibility.

Dr. Dye replied that it did not but that, at the moment, the addict is not held to prosecution at all, whereas the doctor has all the responsibility.

Dr. Sanders asked whether everything could be covered so that the addict could not escape the responsibility and how fraud on his part could be proved.

Dr. Metcalf answered that the amount obtained was proof. For example, when a man buys 100 tablets of morphine, ½ grain each, he is considered an addict.

The motion was carried.

The Committee on Officers' Reports commended the faithful and efficient work of the Secretary-Treasurer and recommended that, at the next revision of the by-laws, the Committee on Medical Economics be changed from a rotating to a standing committee.

Dr. D. G. Smith suggested that the Committee on Medical Education should also be changed.

Dr. Dye moved that both committees — the Committee on Medical Education and Hospitals and the Committee on Medical Economics — be made standing committees.

Dr. Sycamore recommended that at the next revision of the by-laws, the Committee on Medical Education and Hospitals and the Committee on Medical Economics be changed from rotating committees to regular standing committees.

Dr. Dye suggested that this matter be referred to the Committee on Constitution and By-Laws, with the request that it be reported the following day.

Dr. Sycamore accepted the amendment.

This motion was duly seconded and was carried.

Because of the amount of business to be transacted, it was voted to omit the reading of the councilors' reports.

Reports of Councilors

Belknap County

The Belknap County Medical Society held six meetings from November to April inclusive. The meetings were all well attended, and the excellent quality of papers was maintained. A different member was responsible for each meeting.

The Society lost one member by death and gained four new members.

C. S. Abbott

Carroll County

The Carroll County Medical Society held its meetings as usual.

Our membership is small but our spirit is excellent.

One member is now in the Army Medical Corps, and of course, others may follow.

Our spring meeting has been postponed to a later date than usual because of the absence of our President, but this meeting will be held early in the summer.

Charles E. Smith

Cheshire County

The Cheshire County Medical Society held two meetings during the past year. At each meeting, papers were read by visiting men. Each paper was discussed at length and this added much interest to the meetings.

We have had no increase in membership in the past year. One member is in service at the present time, and several more are awaiting call.

John J. Brosnahan

Coos County

The Coos County Medical Society has not met this year. We are expecting a grand meeting this spring after the State Society meeting. On this account, I have little to report. I am hoping for more interest among the profession this coming year.

Richard E. Wilder

Grafton County

The annual business meeting of the Grafton County Medical Society was held at the Grafton County Hospital, North Haverhill, on October 9, 1941. Election of officers took place, and nine new members were received.

A group discussion was led by W. F. Putnam, of Lyme, on "Pitfalls of Medical Practice."

Three other meetings were held during the year. On December 11, the Society met at Hale's Tavern, Wells River, Vermont, for dinner, and a group discussion on "Common Respiratory Infections" was led by E. C. Campbell, of Woodsville.

The meeting of January 29, 1942, was held at the Littleton Hospital. A discussion on "Uterine Hemorrhage" was led by H. C. Pickwick of Lisbon.

On February 26, the society convened again at Hale's Tavern, Wells River, Vermont. The discussion on "Uterine Hemorrhage" was continued.

The programs of these meetings dealing with everyday problems of general practice were arranged purposely to stimulate discussion and active participation of a larger number of members.

A. W. Burnham

Hillsborough County

The Hillsborough County Medical Society during the last year has had the largest membership since it was founded. We have at present 146 members.

At our meeting in Manchester, November 18, 1941, we had two very interesting papers, one by Dr. Alfred L. Frechette, on "Venereal Disease Problems in New Hampshire," and one by Dr. Thomas J. Anglem, on "Chemotherapy in Surgery." During the morning session, Dr. Charles H. Parsons gave a very detailed talk on "Medical Organization for Civilian Defense" in this state. This was of great value, and I understand that practically every town in Hillsborough County has a medical setup as part of its civilian defense.

A spring meeting was held at the Nashua Country Club, where Dr. Dolloff, president of the New Hampshire Medical Society, spoke, and where papers were presented by Dr. Charles H. Rammelkamp and Dr. Otto J. Hermann, of Boston.

A very largely attended meeting was held at Alma's Tea Room, Manchester, on April 28. Dr. Deering Smith gave a complete outline of the Procurement and Assignment Service. Interest ran high, as shown by the fact that three hours were taken up in the presentation and discussion of this subject. Dr. W. D. Thibodeau, president of the Hillsborough County Medical Society, complimented Dr. Smith on his excellent presentation.

I am of the opinion from my observation that more interest is being taken in the county meetings. This is shown by an increase in membership and the attendance, which is about fifty at each meeting.

Clarence O. Coburn

Merrimack County

The Merrimack County and Center District Medical Society has held four meetings during the past year.

At a meeting on July 2, 1941, held at the Franklin Country Club, Dr. Lewellys F. Barker, professor emeritus of medicine at Johns Hopkins University School of Medicine, spoke on "Heredity." Dr. R. J. Weissman, of Franklin, was voted into membership.

On October 8, a meeting at the Eagle Hotel, Concord, was addressed by Dr. Champ Lyons, of the Massachusetts General Hospital, who spoke on "Chemotherapy." He recommended sulfadiazine as the drug of choice. Dr. W. H. Norton, of Andover, was admitted to membership. It was voted to send $100.00 to the National Committee for Extension of Medical Service.

On January 7, 1942, the annual meeting was held at the Eagle Hotel. Dr. Edward Putnam was elected president, Dr. Philip Forsberg was elected vice-president, and Dr. Warren Butterfield was re-elected secretary-treasurer. Dr. Charles H. Dolloff, president of the New Hampshire Medical Society, spoke briefly. With Dr. Carroll Cilley,

county commissioner, as guest, the present-day relief problems were discussed at considerable length. Drs. Bland, Moriarty and Philbrook, of the State Hospital Staff, were elected members of the Society.

On April 1, 1942, a meeting was held at the Eagle Hotel. At the request of the Auxiliary, future meetings are to be held on the first Tuesday of the month. Dr. Deering Smith, of the Procurement and Assignment Service, spoke on medical enlistments. In recognition of his long membership and service to the profession, Dr. Chancey Adams was presented with a suitable gift.

HENRY H. AMSDEN

ROCKINGHAM COUNTY

The annual meeting of the Rockingham County Medical Society was held at the Mitchell Memorial Hospital, Brentwood, on December 17, 1941. Officers for the following year were elected, and four new members were admitted. Luncheon was served by the county commissioners and superintendent.

The afternoon session was devoted to a discussion of the medical-defense setup in this county. In outlining plans for the organization of medical-defense units, consideration was given to the necessity of some unification of system, and the recommendation was made that each community take suitable steps regarding equipment, trained workers and physicians at hand.

The spring meeting of the society was held at Exeter Hospital on April 28, 1942. Twenty-eight members were present. At the business meeting, following a discussion concerning the methods used and the extent to which chiropractors were encroaching on the practice of medicine in Rockingham County, a motion was adopted instructing the county's delegation to bring this matter to the floor of the State Society House of Delegates for action.

After further discussion, a motion was adopted instructing the County Delegates to bring to the attention of the State Society House of Delegates the problem of medical officers in the United States Navy practicing private medicine while on duty. There was evidence that such practice was occurring at Portsmouth Navy Yard. It was further requested that a ruling on this matter be obtained from the Navy and War departments from the Commandant, Portsmouth Navy Yard, and from the State Board of Registration in Medicine. One new member was admitted.

After luncheon at the hospital, Dr. D. G. Smith, of Nashua, Chairman of the New Hampshire Procurement and Assignment Service, gave a detailed résumé of the present status demands of the Government on New Hampshire physicians for war service. He stated that the quota for the next sixty days was fifty doctors, and warned that more would be called for, urging full cooperation to help fill the immediate quota of the State under the direction of the medical profession itself, rather than under assumption of powers of draft by the government authorities.

CLEON W. COLBY

STRAFFORD COUNTY

The Strafford County Medical Society had for the year 1942 thirty-four active and six affiliate members.

The annual meeting was held on October 22, 1941, at the University Commons, Durham, New Hampshire. It was the one hundred and twenty-fourth annual meeting of this society and was attended by twenty-three members and a guest. Dr. Charles H. Dolloff, president of the New Hampshire Medical Society, presented informative material regarding the "Newer Treatments of Mental Diseases."

A special meeting of the society was held on March 8, 1942, at the American House, Dover, New Hampshire. Twenty-one members were present. The purpose of this meeting was to discuss and act on an increased fee table for medical services in Strafford County, the fees then existing being lower than the usual fees elsewhere in New Hampshire. A new minimum fee schedule was adopted and went into effect on March 15, 1942.

The spring meeting was held at the new Frisbee Memorial Hospital in Rochester, New Hampshire, on April 29, thirty-one members and guests being present. After the usual business meeting, Dr. Samuel Levine presented an excellent paper on "Heart Disease, Electrocardiography and the General Practitioner," a lecture of great service to those present. Dinner was served by the hospital authorities, and the local doctors conducted the "out-of-towners" on a tour of the hospital. Rochester may well be proud of this beautiful gift to their community.

There were no deaths among our members during the fiscal year.

Dues were all paid promptly and disbursed to the state society treasurer on February 3, 1942.

J. A. HUNTER

SULLIVAN COUNTY

The Sullivan County Medical Society enjoyed its usual activity during the past year. All physicians practicing in the county are members of the society, and the percentage of attendance at meetings is always high.

At the annual meeting held in Claremont, we were favored in having as our guest Dr. Charles H. Dolloff, of Concord, president of the New Hampshire Medical Society, who spoke on "Medical Defense" and other timely subjects.

In addition to the election of officers for the coming year, there was a scientific program with free discussion by many of the members.

Luncheon was served at the Claremont General Hospital. Our next meeting will be held at Charlestown during the summer.

EMERY M. FITCH

In the absence of Dr. Woodman, Dr. Dye stated that the members of the Committee on Amendments to the Constitution and By-Laws knew of no necessary amendments to the constitution and by-laws that should be brought up for this year.

In the absence of Dr. Stewart, Dr. Sycamore read the report of the Committee on Child Health.

Report of the Committee on Child Health

The Committee on Child Health co-operated in the presentation of a series of radio talks on various aspects of child health, given under the auspices of the New Hampshire Congress of Parents and Teachers and the New Hampshire Pediatric Society. These were broadcast over Station WFEA, beginning in October and continuing into February.

At a meeting on February 18, the recommendations of the Children's Bureau regarding immunization of children as a war measure were considered as they applied to New Hampshire. It was agreed:

1. That it would be desirable to have all children over nine months of age immunized against diphtheria and smallpox;

2. That it would be better to defer any large-scale attempt at immunizing against tetanus until a uniform system of tagging such children could be worked out for the country as a whole;

3. And that immunization against typhoid fever could be deferred until such time as evacuation of cities became necessary, and could then best be done at evacuation centers as a mass procedure.

COLIN C. STEWART, *Chairman*
TRAVIS P. BURROUGHS
FRANKLIN N. ROGERS

Dr. Sycamore stated that the Committee on Officers' Reports commended as a valuable educational method the activities of the Committee on Child Health in co-operating in the presentation of radio broadcasts.

The conclusions of the committee regarding immunization of children as a war measure were approved, and it was recommended that the House of Delegates instruct the Committee on Child Health and the Committee on Public Health to confer with and co-operate with the appropriate State and Federal agencies, with a view to carrying out the immunization against diphtheria and smallpox of all children over nine months of age.

Dr. Sycamore moved the adoption of this portion of the report.

This motion was duly seconded and was carried.

Report of the Committee on Public Health

The Committee on Public Health is a new one, being first elected in 1941; no one on the committee knew its duties or its function. Communication with Dr. Metcalf, secretary of the New Hampshire Medical Society, concerning its duties referred us to Dr. Burroughs, of the State Board of Health, and after some thought we are of the opinion that we are liaison officers between the New Hampshire Medical Society and the State Board of Health.

We have had five meetings in Concord. The first was held at the office of Dr. Burroughs at the State House on September 26, 1941. Drs. Burroughs, Frechette, Vintner, Powers and Smart were present. The discussion was concerned mainly with whether or not the New Hampshire Medical Society, as represented by the Committee on Public Health, would recommend or sanction the Board of Health, with the aid of the New Hampshire Tuberculosis Association, to make mass x-ray studies in any or all industries requesting such examination in an attempt to find patients affected with tuberculosis. The Venereal Division is also to be allowed to do the routine blood Wassermann examinations. Patients, after the above check, are to be referred back to their own physicians. After much discussion, it was decided to inquire of other states their experience regarding the cost of such studies and the reactions of the physicians in the states that have held these industrial examinations.

This meeting was then adjourned.

The second meeting was held on September 30, 1941, in the same location and Drs. Burroughs, Vintner, Powers and Smart were present. The above-mentioned program was discussed and Dr. Metcalf, secretary, was called in to give his advice, which was that the present policy of the New Hampshire Medical Society would, he thought, be against the State Board of Health's taking over such a program. New Hampshire is one of the most highly developed industrial states, having about 142,000 on the employees' compensation roll. It seems to your committee that such an ambitious program of mass x-ray films would entail a large expense, and we are of the opinion that in this time of war upheaval it might be better to await a more thorough investigation by the Committee on Public Health concerning the time and desirability of such a program.

The second important question that came to your committee's attention was that of having the State Board of Health, in collaboration with the Committee on Public Health, formulate certain minimum requirements for first-aid rooms in industries so that there would be some place in the State where such guidance could be found for industries that are now trying to establish their first-aid accommodations. An outline has been drawn up, and your committee recommends that the Medical Society adopt this plan.

Another meeting was held on March 13, 1942, in the Governor's Council Chamber at call of John J. Hallihan, of the Department of Public Welfare, a committee appointed by the Governor to accumulate firsthand knowledge of the tuberculosis situation in New Hampshire, and especially the sanatoriums; two weeks later, your committee inspected the Pembroke Sanatorium, and later was requested to inspect the Glencliff Sanatorium. This study is incomplete, and no report is possible at present.

Finally, the National Council on Industrial Health requests that the Society send a representative to its fifth annual meeting, and it is the opinion of your committee that, if the New Hampshire Medical Society desires an active and progressive public-health committee, it authorize the sending of such a representative to this meeting.

CHESTER L. SMART, *Chairman*
HARRIS E. POWERS

Dr. Sycamore stated that the Committee on Officers' Reports commended the members of the Committee on Public Health for the vigorous and judicious activities of this new committee. Their decision that further study should be given to the question of mass x-ray and serologic examinations in industrial establishments was approved.

Dr. Sycamore recommended that the House of Delegates approve the collaboration of the Committee on Public Health with the State Board of Health in formulating minimum requirements for first-aid rooms in industries.

In view of the importance of industrial health in the war effort, it was recommended that the committee be authorized to send a representative to the National Council on Industrial Health, the expenses of the representative to be defrayed by the Treasurer.

A motion to adopt this portion of the report was duty seconded and was carried.

Dr. Benjamin P. Burpee then presented the report of the Committee on Maternity and Infancy.

Report of the Committee on Maternity and Infancy

There was a gratifying reduction in the maternal death rate for 1941. For eight years, the committee has studied and analyzed every maternal death reported, making an effort to appraise, so far as possible, the problems relating to causes of death among mothers and infants.

Each year, the committee has made its report to the New Hampshire Medical Society, but in the past five years, including 1942, the report has been printed and distributed widely to physicians, hospital superintendents, and nurses. It is our opinion that the results shown and recommendations made — based on findings in the analysis of each case — have been of definite assistance to many physicians in the conduct of obstetric practice. For the past two years, the committee, through its agent, has corresponded with each physician reporting a maternal death, with the view to making such suggestions or rendering such consultation as may be of value. Many physicians have responded with interest and gratitude for the suggestions and recommendations of the committee. During the past year, there was an unusual display of co-operation, every physician and hospital being most willing to supply the committee with all possible help and information.

As in the past, the study was conducted by the committee through an agent, the only person knowing the identity of the physician and patient or hospital. That person is the Director of the Division of Maternal and Child Health of the State Board of Health. Each case was studied objectively and thoroughly, the committee endeavoring to analyze the facts and draw conclusions from those facts. In some cases, obviously, no definite conclusions regarding the exact cause of death could be made. This was true chiefly in cases in which no autopsy findings were available. However, the committee endeavored to classify each death.

Prevention of maternal and infant deaths is, of course, the prime concern of all. In this analysis, it is encouraging to note that most of the deaths were in the classification of unavoidable and that many were due to accidents of pregnancy.

The study of infant deaths and stillbirths was less thorough, because it was impossible to gather complete data on such large numbers of cases. The best that could be done was to appraise the deaths by means of the causes reported. In the report, the deaths are tabulated as to causes, and some conclusions were drawn from such a tabulation.

Stillbirths were analyzed from the data secured from questionnaires sent to physicians reporting stillbirths. Most questionnaires were filled out and returned, but some information is lacking from others. A tabulation of stillbirths as to reported causes follows in the report.

It should be understood at the beginning that the remarks and recommendations of the committee are entirely impersonal and objective, since the committee did not know the identifying information for any case reported.

The record of marked decreases in maternal mortality is of special significance in view of the present emergency and under war conditions. With the possible disruption of family life, changes of large groups of population, housing and sanitary problems resulting from possible crowding in defense areas in the State, the inevitable shortage of medical and nursing personnel in many areas may show serious effects on family life in New Hampshire, as elsewhere, and may cause a rise in maternal and infant mortality. The new low rate of 1.8 per 1000 live births for New Hampshire may therefore serve not only as a measure of past accomplishments but also as a means of pointing to the possibilities in meeting the difficult problems of the future.

This low rate is significant not only in terms of fewer maternal deaths but also in that the birth rate in the State was higher than at any time since 1920. It is the hope of the committee that despite problems and difficulties arising out of the war, physicians and hospitals will not relax their standards of good care, but will in fact press every effort to advance toward better obstetric practice.

During the year, the committee held five meetings.

Maternal Deaths

In 1941, there were 17 maternal deaths. During that year, there were 9616 live births. The rate for maternal mortality was therefore 1.8 per 1000 live births. Each of the 17 deaths was studied and classified according to the *International Classification of Causes of Death* (fifth revision). These deaths were reported for the calendar year ending December 31, 1941. Following an appraisal and scrutiny of each case, the committee reclassified the deaths into categories of causes according to the data received and conclusions drawn from the data, as follows:

Code No.	Cause of Death	No. of Deaths
140 (*c*)	Abortion (self-induced)	2
140 (*d*)	Abortion (not self-induced)	1
144 (*a*)	Toxemia of pregnancy, with convulsion — death before delivery	2
148 (*a*)	Toxemia of pregnancy — death after delivery	2
146 (*a*)	Placenta previa (post-partum hemorrhage)	1
146 (*c*)	Post-partum hemorrhage	2
147 (*b*)	Puerperal septicemia	1
147 (*d*)	Puerperal embolism	2
149 (*a*)	Accidents of pregnancy (inversion of uterus)	1
149 (*b*)	Accidents of pregnancy (malposition, cesarean section, emboli and so forth)	3
		17

In order of frequency of cause as determined by the careful analysis of each case, the committee reclassified them as follows:

Cause of Death		No. of Deaths
Toxemias of pregnancy (all types)		4
Accidents of pregnancy		5
Puerperal embolism	3	
Inversion of uterus	1	
Transverse position	1	
Post-partum hemorrhages		3
Placenta previa	1	
Retained placenta	1	
Cause undetermined	1	
Abortions		3
Cesarean sections		1
Puerperal sepsis		1
		17

Only two cesarean sections were performed in the 1941 series of maternal deaths. One was performed for a good indication, but one was done for what the committee considered no proper indication.

In the series, only three autopsies were performed.

As in the past, all cases were further classified into three categories, — Group I, those in which the patient was at fault because of refusal of prenatal care, neglect, or self-induced abortion and so forth; Group II, those in which the obstetric treatment was inadequate; Group III, those which were apparently unavoidable, — as follows:

Classification	No. of Deaths
Group I	4
Group II	5
Group III	8
	17

The causes of death in Group I, in which the patient was at fault, were as follows:

Cause of Death	No. of Cases
Induced abortion	3
Toxemia of pregnancy (treatment refused)	1
	4

The causes of death in Group II, in which the obstetric care was inadequate, were as follows:

Cause of Death	No. of Cases
Post-partum hemorrhage	1
Cesarean section	1
Puerperal septicemia	1
Toxemia	2
	5

The causes of death in Group III, in which the deaths were apparently unavoidable, were as follows:

Cause of Death	No. of Cases
Inversion of uterus	1
Acute pulmonary edema	1
Pulmonary embolism	1
Puerperal sepsis	1
Post-partum hemorrhage	2
Chronic nephritis	1
Cesarean section (obesity)	1
	8

Some gratifying facts are noted concerning the causes of deaths as classified in the foregoing tables. In the first place, the majority of deaths were undoubtedly accidents of pregnancy. Coming under this group are of course the embolic phenomena, malpositions, inversion of the uterus and adherent placentas. There was less evidence that really poor obstetrics was practiced in the handling of such problems in this series of cases, as compared with past series. The medical profession would like to believe that the increasingly lowered death rate is due to better obstetrics.

Toxemias continued to be proportionately the chief cause of death in New Hampshire. The largest number of deaths were due to accidents of pregnancy. In the United States as a whole, infections were the chief cause of death, causing 41 per cent* of the maternal deaths in 1940 (figures for 1941 for the United States as a whole are not available). As compared to infections, the toxemias caused 25 per cent of maternal deaths in the country as a whole in 1940, and post-partum hemorrhage was the cause of 23 per cent.

Because toxemias still present the greatest problem, the committee believes that recommendations regarding accepted methods of treatment should be reiterated in this report; this follows below.

If accidents occurring in pregnancy, at the time of delivery or in the post-partum period are excluded, the other deaths recorded were for the most part preventable. Induced abortions are surely unnecessary, and should be vehemently stopped. It does present a real problem in the efforts of the profession to reduce maternal mortality. The medical profession should not rest until every preventable cause of maternal death is reduced to an absolute minimum.

In the 1941 series, 15 patients were delivered in hospitals, and 2 in the home. The following data on urban and rural residency are also of interest:

County	Urban Cases	Rural Cases	Total Cases
Belknap	0	0	0
Carroll	0	1	1
Cheshire	4	2	6
Coos	1	1	2
Grafton	2	0	2
Hillsborough	4	0	4
Merrimack	0	0	0
Rockingham	1	0	1
Strafford	1	0	1
Sullivan	0	0	0
	13	4	17

To illustrate the trend in maternal mortality statistics, the following data are presented:

*Figures obtained from United States Bureau of the Census.

Year	No. of Deaths	Maternal Mortality Rate Per 1000 Live Births
1930		6.2
1932		5.4
1933		6.3
1934		5.4
1935	46	6.1
1936	37	4.8
1937	34	4.3
1938	24	3.8
1939	25	3.1
1940	24	2.8
1941	17	1.8

Data are available from the United States Bureau of the Census for maternal deaths for 1940. It is of interest that, in a comparison of percentage decrease in maternal deaths for the period of 1931–35 with 1936–40, New Hampshire had a 37.5 per cent decrease in the latter period. The maternal death rate in 1931–35 was 6.27 per 1000 live births, as compared with 3.92 in 1936–40. With the present low maternal death rate of 1.8 per 1000 live births, this percentage decrease is most gratifying. New Hampshire is grouped with the states that show a percentage decrease of 35 per cent or more for the period.

These census figures further indicate that for 1940, 11 per cent of the total maternal deaths were due to abortions and 7 per cent were due to ectopic gestation; 26 per cent of patients died before delivery, and 56 per cent died during or after delivery. It seems that many of the 56 per cent of deaths occurring during or after delivery could have been prevented. Many of the deaths in this period were due to infection.

In next year's report, it may be possible to include figures based on these problems for the 1941 deaths. Such figures have not as yet been analyzed.

The increasing and apparent downward trend in maternal mortality rates is significant statistically, and it can be inferred that better obstetric care, more adequate hospital facilities, better quality of nursing care and improved methods of treatment are most presumably responsible. These efforts must continue with all the vigor of the profession and agencies engaged in educational health work for the civilian population.

One outstanding improvement should be commented on. This is a matter of hospital records. It was definitely apparent that better records, more complete information, more laboratory findings and so forth were available in hospital cases. Physicians are still found to keep very inadequate or no records. Physicians should realize that good records are not only indispensable in the intelligent care of a patient but also a protection to the physician in the event of legal procedures.

As reported for last year, hospital facilities have improved markedly. Several hospitals have built new wings for maternity and infant care; better fire protection was provided, and New Hampshire has a new well-equipped hospital to add to its facilities. On the whole, the care of maternity patients has shown an encouraging improvement. The efforts of public-health agencies regarding such improvement are well worth mentioning.

In most cases, more prenatal care was sought by patients and provided for by the medical profession.

Recommendations and Comments

Recommendations of the committee and comments on problems arising have been considered of value to physicians reporting their numerous problems and to those who are aware of difficulties connected with the puerperium. This year, the recommendations are based on

actual case studies analyzed from data collected and presented herein by way of illustration. The comments arose from the objective conclusions arising out of the study. The more important recommendations of past years are also included for emphasis by repetition.

The committee recommends that no attempt be made at the delivery of a central placenta previa from below in either a primipara or a multipara.

It is recommended that in cases in which an adherent placenta occurs, 1 cc. pituitary extract be given at two-hour intervals and accompanied by the Credé maneuver only at the same time that pituitary extract is given. This should be tried before any attempt at manual removal is made. Manual removal is unjustifiable under 12 hours unless there is excessive and uncontrollable bleeding. The Credé maneuver, moreover, should be performed with care and skill, so as to avoid trauma of the uterus.

The committee disapproves of the use of vaginal or cervical packs. The danger of masking the bleeding into the uterus and of subsequent infection is feared by such methods.

Cesarean sections should not be performed without competent consultation and without absolute indication. The committee believes especially that a section should not be done when the membranes have been ruptured for twenty-four hours.

Versions should not be done unless the patient is deeply anesthetized.

The committee believes that most occiput posterior positions will right themselves or deliver spontaneously if enough time is allowed and watchful waiting considered.

The committee recommends that autopsies be performed on every maternal death.

In addition to recommendations based on the 1941 study, the committee reiterates that physicians should keep better and more useful records; that hospitals require consultations for operative deliveries; and that when hospital facilities are available, every possible effort be made in the diagnosis and intelligent treatment of toxemias, anemias, malpositions, infections and other complications of pregnancy.

Infant Mortality

The following is a tabulation of causes of deaths in infants as reported on the death certificates. These are divided into periods as to when the deaths occurred in relation to birth for those under one year of age.

Cause of Death	No. of Deaths
Deaths occurring on or before the first day of life	
Prematurity	98
Congenital deformity	21
Asphyxia	8
Other	7
Cerebral hemorrhage	6
Unknown	3
Birth injury	7
Hemorrhage of newborn	1
	151
Deaths occurring in the first month, exclusive of the first day	
Prematurity	16
Congenital deformity	16
Cerebral hemorrhage	9
Asphyxia	3
Atelectasis	4
Intestinal obstruction	2
Gastroenteritis	2
Pneumonia	8
Other	7
Malnutrition	2
Syphilis	1
	70
Deaths occurring from the second to the twelfth month, inclusive	
Pneumonia	36
Other	12
Gastroenteritis	13
Malnutrition	10
Suffocation	9
Congenital malformations	8
Whooping cough	5
Unknown	4
Septicemia	1
	98

The total number of infants who died in 1941 under one year of age is 319; in 1940, there were 274 deaths. This is a challenging increase. The largest single cause of death is still given as prematurity, and it is interesting that as many as 9 infants died of suffocation from carelessness. Many of the congenital deformities were due to congenital heart disease.

The infant death rate for 1941 is 33 per 1000 live births.

The infant mortality rates per 1000 live births by years are as follows:

Year	Rate
1935	54
1936	47
1937	48
1938	48
1939	45
1940	32
1941	33

Stillbirths

Two hundred and eighty-one stillbirths were reported in 1941. Questionnaires were sent to all physicians reporting stillbirths, and answers were received for 182 cases.

The causes of stillbirths were tabulated as follows:

Cause	No. of Cases
Prematurity	24
Congenital deformity	34
Instrumental delivery	13
Toxemias	13
Cerebral hemorrhage	6
Deformities of placenta or cord	50
Unknown	26
Other	16
	182

The number of stillborn infants reported from year to year varies markedly. Many of the stillbirths this year were reported on the questionnaires as due to abnormalities of the placenta or accidents caused by a twisting of the cord about the baby's neck. The committee does not believe that such conditions constitute real causes for stillbirths. A large number of infants died without any apparent or proved cause, even after autopsy findings were recorded.

Stillbirths for the past few years were as follows:

Year	No. of Cases
1937	181
1938	242
1939	211
1940	187
1941	281

No conclusions can be drawn concerning this variation.

The committee wishes to express its gratitude and satisfaction for the excellent record shown in New Hampshire in 1941 concerning reduced maternal mortality. Appreciation is expressed for the co-operation of physicians and hospitals in making this report possible, and for the encouraging improvements in hospital facilities and better obstetric practices. As in the past, thanks should be given for the co-operation of the Division of Maternal and Child Health of the State Board of Health, whose facilities and personnel were used by the committee in making this study and in preparing this report.

Robert O. Blood, *Chairman*
Benjamin P. Burpee
Marion Fairfield

(To be concluded)

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT

TRACY B. MALLORY, M.D., *Editor*

CASE 28311

PRESENTATION OF CASE

First admission. A fifty-eight-year-old Polish housewife was admitted to the hospital because of weakness and shortness of breath of three years' duration.

Seven years before entry, the patient fractured her right humerus while pushing away a heavy object. In the next few years, she began to have various body aches, centering in the lower part of the back, shoulders, arms and legs. These aches were not related to posture, fatigue or exertion. There was insidious onset of slight weakness and shortness of breath on exertion. Two years before entry, the patient slipped while scrubbing a floor, and sustained another fracture through the upper right humerus. At that time, roentgenograms taken by a physician showed extensive bone destruction of the proximal half of the humerus by a trabeculated cystic lesion, and similar destructive processes in the right seventh rib, the proximal end of the left femur, and the right and the left ilium. There was also an old fracture of the right clavicle. The patient was given roentgen-ray therapy in nine doses over a period of two weeks in total amounts of 1600 r to the left femur, 1800 r to the right humerus, and 3500 r to the right and left parathyroid regions (half to each side); there was tanning of the skin. Roentgenograms taken nineteen months before entry showed new-bone formation in the areas of destruction noted earlier in the right shoulder, but no change in the lesions in the pelvis. Thirteen months before entry, an additional treatment of 1200 r was given to the parathyroid regions. Fourteen months before entry, blood examinations by another physician showed a red-cell count of 2,600,000 with 55 per cent hemoglobin, and a white-cell count of 3300. The serum calcium was 11 mg. and the phosphorus 3.5 mg. per 100 cc., and the phosphatase was 1.5 Bodansky units. The patient was given large doses of dicalcium phosphate and vitamin D, with progressive relief from body aches. Courses of liver-extract injections, daily doses of ferrous sulfate and three blood transfusions were also given, but there was only transitory improvement in the blood picture. In the two years preceding entry, the patient had several attacks of severe sharp pain in the lumbar region, not relieved by mustard plasters. She had no chills, fever or hematuria in association with these attacks; however, about a year before entry, there was blood in the urine on several occasions when there was no back pain. She never passed gravel. There was no polydipsia.

The past and family histories were irrelevant. The menses were normal until the menopause ten years before entry.

On admission, the patient appeared elderly and obese. The mouth was edentulous, with pale mucous membranes. There were palpable thickenings of the midportion of the right clavicle and upper right humerus. A single small node was palpable in the right axilla. The heart and lungs seemed normal. The tip of the spleen was easily felt beneath the costal margin in the anterior axillary line. It was firm and not tender. The abdomen and extremities were otherwise normal. Pelvic examination showed a large laceration of the cervix, with surrounding erosion.

The blood pressure was 150 systolic, 90 diastolic. The temperature was 100°F., the pulse 92, and the respirations 20.

Examination of the blood showed a red-cell count of 2,130,000 with 7.4 gm. hemoglobin and 2.8 per cent reticulocytes. The red cells showed stippling and polychromasia. The white-cell count was 2200 with 69 per cent polymorphonuclears, 26 per cent lymphocytes and 3 per cent monocytes. The blood Hinton reaction was negative. The formol-gel test was negative. The blood calcium was 14 mg. and the phosphorus 1.5 mg. per 100 cc., the phosphatase 5.4 Bodansky units, the serum albumin 4.7 gm., the globulin 2.1 mg., and the non-protein nitrogen 26 mg. per 100 cc. The cholesterol was 159 mg. per 100 cc. The carbon dioxide combining power was 23.1 milliequiv. and the chlorides 107.2 milliequiv. per liter. The van den Bergh reaction was normal. The urine showed a ++++ Sulkowitch reaction (calcium phosphate in urine), but contained no albumin. There were occasional red and white cells in the sediment. The phenol-sulfonephthalein excretion was 50 per cent in two hours. The urine was positive for 10 mouse units of follicle-stimulating hormone per 100 cc. The excretion of 17-ketosteroids was 3.3 mg. per 24 hours. An electrocardiogram was normal.

Roentgenograms of the skeleton showed extensive decalcification, with thickening of the cortex. There was some new-bone formation in the medial portion of the right ilium, and multiple cysts were present in the upper end of the left femur and in both ilia (Fig. 1). The ribs and humeri also contained cysts. The structure of the skull was markedly altered, with indistinctness of the diploë

and blood vessels. There were platybasia and wedge appearance of the dorsal vertebras. In roentgenograms of the chest, the heart appeared normal. The lung fields showed only apical scars. A rounded mass, 7 cm. in anteroposterior diameter and 6.5 cm. in lateral diameter, lay in the mediastinum below the arch of the aorta and just beneath the sternum. The esophagus showed a traction diverticulum in its middle third. A flat film of the abdomen showed kidney shadows slightly smaller than usual. Two small areas of calcification lay in the region of the lower pole of the left kidney. A laminated gallstone-like structure lay in the liver region. The spleen appeared enlarged. An intravenous pyelogram showed prompt excretion of dye. The pelves and calyxes were relatively small, with the aforementioned stone on the left, but were otherwise negative.

FIGURE 1.

The patient was given 1200 r to the anterior mediastinal field, and a similar amount to the posterior mediastinal field. Repeated chemical studies of the blood showed no essential change after the irradiation. The patient was given a blood transfusion and discharged to the Out Patient Clinic.

Second admission (three months later). The patient continued fairly well, and was able to do housework. There was some pain in the back and shoulders, with weakness and a sense of heaviness in the chest. Four weeks before readmission, a persistent cold was contracted. Pains then reappeared in the right arm at the site of the old injury, and there was some cramping in the legs. There were several slight nosebleeds. The appetite was only fair.

On readmission, physical examination was essentially as before. An area of dullness over the sternum at about the second interspace extended to the left about 2 cm. Laboratory data were essentially as before. Throat, blood and urine cultures were negative. The corrected blood sedimentation rate was 0.9 mm. per minute.

A roentgenogram of the chest showed no essential change in the mass in the mediastinum.

On the twentieth hospital day, an operation was performed.

DIFFERENTIAL DIAGNOSIS

DR. JOSEPH C. AUB: We have here the story of a Polish woman, past the menopause, with progressive fatigue, marked bone and muscle pains, anemia, a large spleen and too few white cells. These findings had lasted for years. She had known that she had bone lesions for two years, and large doses of x-ray therapy did nothing to them. The duration and course of the difficulty

practically rule out the diagnosis of myeloma.

The low 17-ketosteroid excretion puzzles me. It should be higher after the menopause.

DR. FULLER ALBRIGHT: That is all right for a debilitated person.

DR. AUB: Yes, but a little low.

DR. ALBRIGHT: Low for a normal person.

DR. AUB: These x-ray films are fascinating. I should like to ask Dr. Schatzki about the skull and about the feet. What does "platybasia" mean?

DR. RICHARD SCHATZKI: In platybasia, the cervical spine is pushed into the floor of the posterior fossa, like a piston. This occurs during early development.

DR. AUB: Should it help me in the diagnosis?

DR. SCHATZKI: I do not believe so. Whether it may develop later in life, I do not know.

DR. ALBRIGHT: Yes; it does. Any decalcifying process will do it.

DR. AUB: Is that motheaten appearance more than normal, according to your technic?

DR. SCHATZKI: Yes.

DR. AUB: What about the toes?

DR. SCHATZKI: I am wondering about them myself. I should say that although the cortex of the skull is definitely thickened, the cortex of the toes is by no means thickened, but thin, and they are decalcified. I should say that the feet show merely marked decalcification.

DR. AUB: Are these trabeculae abnormal?

DR. SCHATZKI: There may be tiny cysts in one of the toes, but actually all you see in the feet can be explained by decalcification.

DR. AUB: Is this traction of the esophagus just where the tumor in the chest is?

DR. SCHATZKI: No; I should say that was a traction diverticulum of the esophagus — it is of no clinical importance.

DR. AUB: They do not fit together — the mass and the traction diverticulum in the esophagus?

DR. SCHATZKI: The mass is in the anterior mediastinum in front of the arch. It has nothing to do with the esophagus. It is far away from the esophagus.

DR. AUB: I think this is a very puzzling case. Of course, the obvious diagnosis is parathyroid tumor. The patient had a high calcium, low phosphorus and a normal phosphatase level in the blood. She had kidney stones, and was passing bloody urine. All these things are typical of hyperparathyroidism, but I do not want to make the diagnosis because she also had a large spleen and something wrong with the blood. There are several red herrings in this case, such as the mass in the chest. It may have been a thymoma, but so far as I know, they never give a syndrome like this. It may have been thyroid or parathyroid tumor. We assume it was pushing the esophagus over, and I do not believe a parathyroid tumor would have done that. It may have been Hodgkin's disease or a tumor of the lymphoma series, but the picture does not correspond to generalized reticulum-cell sarcoma because it lasted too long. This bone lesion could be a lipoid dystrophy like Gaucher's disease. May I ask whether there were yellow spots on the scleras, especially toward the inner canthi.

DR. HARRY F. KLINEFELTER: No, there were no pingueculae.

DR. AUB: The patient was fifty-seven years old. Gaucher's disease would give her many of the things she had, but I have never heard of its producing a high blood calcium and a low blood phosphorus. It would give bone lesions. It could give a motheaten appearance like the x-ray picture in the phalanges and the thickened bones of the femurs. It would produce the large spleen, the anemia and the low white-cell count, and could explain all these things and bring the picture together, except for the high blood calcium and low phosphorus. On the whole, I think one of the xanthomas — of which Gaucher's disease would be the likeliest, because of the age — would explain the low cholesterol, and everything else would go with it; I do not believe this woman had cancer. I am quite sure that she did not have multiple myeloma. I do not believe she had lymphoma, and I am unwilling to make a diagnosis of hyperparathyroidism. I do not believe that Gaucher's disease is a good diagnosis, but it is the diagnosis that explains most of the findings and I am therefore willing to make it.

DR. TRACY B. MALLORY: Dr. Schatzki, do you want to comment on the possibility of Gaucher's disease as an explanation of the bone lesions?

DR. SCHATZKI: The spleens in Gaucher's disease are usually larger than the spleen in this case.

DR. AUB: Yes; much larger, and there ought to be little xanthomas in the eyes, which this patient apparently did not have.

DR. SCHATZKI: From the roentgenologic point of view, this is not Gaucher's disease. Cases with Gaucher's disease do not show real cysts.

DR. ALBRIGHT: I think they do not have cysts and are very radiosensitive.

DR. AUB: In Gaucher's disease? No.

DR. ALBRIGHT: Yes.

DR. MALLORY: The authorities seem to disagree.

DR. SCHATZKI: Gaucher's disease does not produce decalcification of the feet.

DR. AUB: No, it does not.

DR. SCHATZKI: One thing is wrong with the description in the abstract so far as the x-ray film is concerned: except for the skull there is no thick-

ening of the cortex of the bones. The cortex of the femur is normal, and that of the humeri, radiuses and ulnas is definitely thin.

DR. AUB: The patient had an elevated calcium output. Should you make a diagnosis of hyperparathyroidism on that femur?

DR. SCHATZKI: I should not rule it out by any means. The femur alone shows the cysts. There are cysts and a thin motheaten appearance. I think that is all right.

DR. AUB: I think it may be xanthoma. However, if you want to ask me what operation should be done, I should operate and take a biopsy of the bone.

DR. EDWARD D. CHURCHILL: You are not advising a splenectomy or mediastinal exploration or a neck-cervical exploration for parathyroidism?

DR. AUB: I strongly suspect that you did look at the lesion in the chest, but I should have had a biopsy of the bone first. Did you do a biopsy?

DR. OLIVER COPE: Yes.

DR. AUB: Of what?

DR. COPE: A biopsy of the ilium.

CLINICAL DIAGNOSIS

Hyperparathyroidism.

DR. AUB'S DIAGNOSIS

Gaucher's disease.

ANATOMICAL DIAGNOSES

Osteitis fibrosa cystica.
Adenoma of the parathyroid.
Neurofibroma of mediastinum.

PATHOLOGICAL DISCUSSION

DR. MALLORY: The wall of one of the cystic cavities in the ilium was chiseled off. The cyst contained material resembling a benign giant-cell tumor, and its bony margins were characteristic of osteitis fibrosa.

DR. AUB: Then, it is obvious that the patient must have had a parathyroid tumor. I do not understand why you x-rayed this woman so hard.

DR. MALLORY: I suggest we defer discussion on that point until Dr. Cope has told us about the second operation.

DR. COPE: We had an amusing time arguing about this diagnosis because none of us was exactly right. Dr. Albright and I thought the tumor mass seen by x-ray study must be parathyroid. Dr. J. H. Means was on service and thought it was not, arguing that it was too low and too large and that it must be thyroid tissue in the mediastinum. But we have seen one parathyroid adenoma in our series that was as large as this. As a matter of fact, the adenoma from the first case we had weighed 53 gm., and one other patient had one almost as large. Chemically, the patient under discussion had an endocrine disease, — hyperfunction of the parathyroid hormone, — and when a tumor mass is demonstrated on physical or x-ray examination, the burden of proof is on him who says that the tumor is not the cause of the disease. X-ray treatment was decided on because this seemed the case par excellence to prove the inefficacy of such therapy. Not knowing exactly where the tumor was in the other 5 patients who had received such treatment, we were never sure that the irradiation had reached the tumor. I was therefore in full sympathy with having this tumor irradiated.

We divided the sternum at operation down the midline, and as I put my finger in to go underneath and push the pleura away from the under surface of the sternum, I felt ahead of my finger a soft, small tumor. It was not in the place of the large tumor, but higher up. By great good fortune for the patient, the actual parathyroid tumor

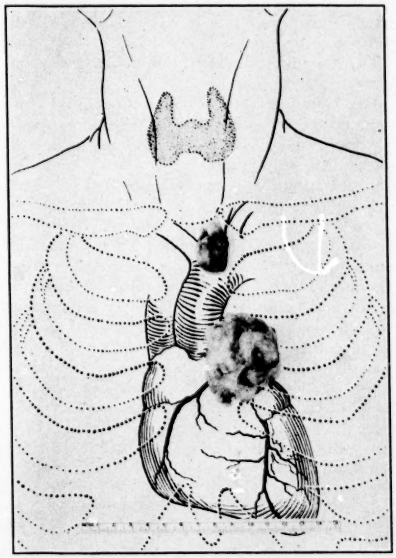

FIGURE 2.

was also in the anterior mediastinum. Its shadow in the x-ray film is probably this one just above the larger tumor. This is a photograph of the two tumors removed at operation, placed on a drawing of the chest and neck (Fig. 2). The parathyroid

tumor was within the thymic capsule, and this lighter colored tissue attached to it is a piece of the normal thymus gland. This patient is one of the roughly 10 per cent of people with hyperparathyroidism whose tumor lies in the anterior mediastinum instead of in the neck. It was good fortune because we did not explore her neck first, and if the tumor had not been in the mediastinum we should have had to explore her neck at a second operation.

We had an amusing time with the pathologists too. I had already taken out the parathyroid gland,—I thought it was parathyroid,—but it was quite green; Dr. Castleman looked at it and said, "Well, I am not sure of that." Dr. Churchill, on the other hand, was quite sure it was parathyroid. We were all agreed about the larger tumor, which was hard and firm and looked like a thyroid tumor.

DR. SCHATZKI: Dr. Albright prompted us to treat the patient because the literature contains numerous reports of beneficial results from treating parathyroid tumors with x-rays. He thought we could see the tumor, and if it shrank we should have definite proof that it was radiosensitive. It did not change in size, however.

DR. ALBRIGHT: I wanted to prove the fallacy of x-ray treatment once and for all.

DR. MALLORY: Microscopic sections of the tumors eventually proved that the smaller mass was a parathyroid adenoma and the larger one a mediastinal neurofibroma. Its presence must be regarded as pure coincidence, and it obviously had nothing to do with any of the symptomatology.

DR. COPE: The color interested me. The parathyroid tumor was brown when I first exposed it within the thymic capsule, but I divided its arterial blood supply. Ordinarily, when we excise a parathyroid tumor, we take the entire pedicle out with one snap, so that the blood is retained within the adenoma. This time, the arterial supply came from above, and the main venous return was from below. I divided the arterial supply first, and all the blood had drained before the veins were severed. With the loss of blood, the tumor turned a curious green. I realized on looking back that I had seen this happen before but had never made proper note of it.

DR. WILLIAM B. BREED: We still have not settled the low phosphatase.

DR. AUB: Did the phosphatase go up?

DR. COPE: Two months after operation, it had gone up. We have not seen the patient since April 18. Immediately after operation she showed the expected changes. The calcium came down promptly. The phosphorus did not go lower, but started up the first week after operation. Had there been any amount of osteoblastic tissue that should have been associated with a high phosphatase level, we should have expected the phosphorus to go down rather than up in the initial postoperative period.

DR. AUB: What about the large spleen?

DR. MALLORY: It could have been hematopoietic. After all, the patient had a considerable portion of bone marrow replaced by fibrous tissue.

DR. AUB: That is uncommon with leukopenia, is it not?

DR. ALBRIGHT: We had another case with equally bad anemia without a large spleen.

CASE 28312

PRESENTATION OF CASE

A twelve-year-old boy was admitted to the hospital because of repeated fractures of the arm.

When a baby, the patient broke his right wrist. Four years before entry, and again two years before entry, he fractured his left arm. Two weeks before entry, the left arm was broken for a third time, in a fall against a curb while the patient was walking. The roentgenogram taken the day after the accident at another hospital showed a fracture of the humerus, and the patient was transferred to this hospital for treatment.

Examination showed a well-nourished and well-developed boy, with normal chest and abdomen. The arms were of equal length, without local swelling, heat or roughness. Tenderness was noted over the medial epicondyle and upper third of the shaft of the left humerus.

The temperature, pulse and respirations were normal.

Examination of the blood showed a white-cell count of 7300 with 70 per cent polymorphonuclears, 20 per cent lymphocytes, 8 per cent monocytes and 2 per cent eosinophils. The blood Hinton reaction was negative. The serum calcium was 11.7 mg., the phosphorus 4.6 mg. and the phosphatase 7.2 Bodansky units per 100 cc.

A roentgenogram of the left arm showed absence of normal trabeculation of the upper two thirds of the humerus, and thinning of the cortex of the upper quarter (Fig. 1). The medullary cavity was crossed by irregular scattered calcified trabeculae giving the pattern of irregular cysts. There was a fracture of the cortex of the medial aspect of the humerus about 1 cm. below the upper epiphyseal line, apparently involving the wall of a cyst, with a fragment of cortex lying transversely across the bone. The upper humerus seemed questionably expanded. No definite soft-tissue mass was visible. The process did not cross the epiphyseal line.

Roentgenograms of the right arm, right thigh and left forearm showed no abnormalities.

On the tenth hospital day, an operation was performed.

Differential Diagnosis

Dr. Ernest M. Daland: We are dealing here with a boy of twelve who had three fractures through the same bone, and this last fracture was apparently due to a very trivial blow. It suggests

Figure 1.

an underlying pathologic condition of the humerus. We must consider three things: simple bone cyst, giant-cell tumor, and a cyst from a generalized process such as osteitis fibrosa cystica, in which there are apt to be many cysts on an underlying parathyroid basis.

I called attention to the fact that there seemed to be no bowing, and in a cyst of the parathyroid type, osteitis fibrosa cystica, there is quite likely to be deformity of the bone and bowing. It is suggested here definitely that there has been a fracture three times through this same cyst, and yet we still have a normal contour of the arm. In reviewing the x-ray films, it is evident that other bones have been examined to rule out the possibility of a generalized fibrous cystica disease. These were reported to be normal and seem to be normal. The serum calcium and phosphorus are high normals,—about what one would expect in a boy of twelve. The phosphatase is normal for a child. I believe, on these grounds, we can rule out osteitis fibrosa cystica, so that the differential diagnosis lies between bone cyst and giant-cell tumor.

The one lesion lies in the upper end of the shaft of the humerus. The note has been made that the condition does not cross the epiphyseal line. That is quite important because a giant-cell tumor at the end of the bone will cross the epiphyseal line, extend all the way to the cartilage of the joint but not cross the joint, destroying everything up to the cartilage. This boy, however, showed a process that stopped exactly at the epiphyseal line. The typical giant-cell tumor is, moreover, an expansile type of tumor, so that the tumor itself is roughly spherical. It would not tend to spread down the shaft so far as this has without widening to a greater degree the bone at the upper end of the shaft. Another characteristic of a giant-cell tumor is that at the lower margin where it tends to go down into the shaft, a saucerlike depression is seen in the films and is also easily demonstrable on the operating table. That is quite typical, and I do not see anything suggesting it here. Other types of tumor involving the medulla tend to diffuse out and disappear gradually down into the medulla. I think this is more suggestive of bone cyst because of its lack of great widening, the lack of spherical tendency and the failure to cross the epiphyseal line. The patient had a trivial fracture, which brought him to the hospital. It is quite typical of patients with bone cyst that a fracture first calls it to their attention. There is a tendency for some of these bone cysts to heal spontaneously, once fractured. This boy had two opportunities, apparently, for spontaneous healing after fracture, but the tumor still persisted. If healing does not occur spontaneously, or as the result of operation, there is a tendency toward extension and further cystic degeneration.

My opinion is that this was simple bone cyst, benign, limited to the one bone and with a fracture. The usual method of handling these cases in this hospital is to open into the cyst and curette out the contents and then fill up the cavity with bone chips or osteoperiosteal grafts. Ordinarily, they heal and give satisfactory regression.

Dr. Laurence L. Robbins: I think the description of these x-ray films is adequate. The appearance is more that of a cystic lesion than of a giant-

cell tumor. It has sometimes been said, and particularly stressed by Dr. M. C. Sosman, that giant-cell tumor never appears until after an epiphyseal line is closed and that it always involves the end of a bone. Atypical cases, which have been called giant-cell tumors on histologic examination, have not crossed the epiphyseal line. This, however, is a fairly characteristic picture of a cystic lesion of a bone.

DR. CHANNING C. SIMMONS: Did the skin in this case show any evidence of pigmented areas?

DR. TRACY B. MALLORY: No.

Have you anything to add, Dr. Smith-Petersen?

DR. MARIUS N. SMITH-PETERSEN: No, except that I am surprised to hear Dr. Daland mention the possibility of giant-cell tumor in a boy of twelve.

DR. DALAND: Geschickter* has reported several at this age.

DR. SMITH-PETERSEN: About how many turned out to be cysts? Have you seen many at twelve, Dr. Simmons?

DR. SIMMONS: I have see one case of epiphyseal chondromatous giant-cell tumor. That one crossed the epiphyseal line in a child of thirteen, as I remember.

DR. MALLORY: What about the relative frequency of spontaneous pain in bone cyst as against giant-cell tumor?

DR. SMITH-PETERSEN: I do not believe there would be any difference.

CLINICAL DIAGNOSIS

Bone cyst, left humerus.

*Geschickter, C. F., and Copeland, M. M. *Tumors of Bone (Including the Jaws and Joints)*. Second edition. 832 pp. New York: *American Journal of Cancer*, 1936.

DR. DALAND'S DIAGNOSIS

Bone cyst (benign).

ANATOMICAL DIAGNOSIS

Bone cyst, left humerus.

PATHOLOGICAL DISCUSSION

DR. MALLORY: This patient was operated on, and a cyst found. The pathologic picture was complicated by extensive hemorrhage, a good deal of it quite fresh and probably secondary to the pathologic fracture. The material curetted out consisted of edematous fibrous tissue, with fresh and old blood in it. No giant cells were found, and nothing that would suggest giant-cell tumor from a histologic point of view.

Would you care to say anything about treatment?

DR. SMITH-PETERSEN: No, except that frequently a little part of the cyst remains and keeps on growing. I think one is apt to be a little too optimistic about the results of packing in bone chips.

DR. DALAND: Was the appearance of this mass that was curetted different from giant-cell tumor? Grossly, could you tell the difference?

DR. MALLORY: I am not at all sure that I could. The cavity was quite well filled with semisolid, deeply blood-stained material. It was not a frankly cystic cavity, but I think the hemorrhage and the complication of fracture were partly responsible for that.

DR. DALAND: Was this found to be one large cystic cavity at operation?

DR. MALLORY: Yes, so far as the operator could make out.

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The Journal does not hold itself responsible for statements made by any contributor.

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MASSACHUSETTS MEDICAL SERVICE

Every licensed physician in Massachusetts will receive by mail this week a brochure describing in detail the methods of operation of the Massachusetts Medical Service, the state-wide system for prepaid budgeting of medical care sponsored by the Massachusetts Medical Society. This corporation, popularly called the BLUE SHIELD, will offer protection to employees and their families against the financial burdens of severe illness. As many physicians know, it is the fruit of more than three years' study by a special committee appointed by the Society and is based on the opinions of the best thinking medical men throughout the country. It is, in effect, the physicians' own answer to the grave social problem confronting the Nation of how best to provide adequate distribution of medical care; and those who have studied the problem believe that this plan is far sounder than the schemes that have been and are being advanced by governmental, state and consumer-co-operative groups.

The present contract will offer hospital surgery, obstetrics and diagnostic x-ray services. It is the initial step in the development of a complete medical service and is limited in scope only because the public is not yet ready for a full-coverage contract. The limitations of the contract, however, do not exclude any physician from participation, and every doctor is urged to participate from the outset of the plan, which will next develop a contract covering all hospital expenses and, finally, one including medical expenses in hospital, home and office.

The Blue Shield is an actuality: its charter has been granted; its capital funds have been provided by the Massachusetts Medical Society; and its offices are open at 230 Congress Street, Boston. It has joined forces with the Blue Cross and will reap the benefits of the hospital plan's wide backing by industrial and business leaders, as well as the confidence of its more than 400,000 subscribers. The Blue Cross will take over the administrative functions and the enrollment of subscribers for the Blue Shield, but each will act as an independent organization, with the allocation of costs subject to the approval of the State Commissioner of Insurance. This arrangement will save duplication of effort, needless expenditure of funds and serious loss of time.

Field representatives will begin calling on physicians this week, immediately after the mailing of the Blue Shield brochure. Obviously, they cannot interview the more than 7000 registered physicians in Massachusetts, and it is hoped that the brochure will explain all the details of the plan so amply that many physicians will sign the contracts without having been interviewed and will return them at once to headquarters.

The tempo of the times is swift, and the social problem that the new plan can solve is pressing. The Blue Shield has announced that it will be

ready for the public, with the Massachusetts medical profession solidly behind it, shortly after Labor Day. This goal can be achieved only if *every* physician in the State makes it his individual responsibility.

INDUSTRIAL MEDICINE FOR PRACTITIONERS

THE precipitous current events in the world at large can leave no lingering doubts in the mind of any group or individual that now is the time to "pick up the ball and run": one should not postpone adjustments, inconveniences or sacrifices that will contribute to the preservation of the Nation. The medical profession is fortunately placed in being able to contribute to this purpose in many ways: the younger members of the profession are being called to posts of active military duty; many of the older physicians are returning to hospital and teaching staffs and even to private practice; and the middle-aged doctors — most of whom served in the last war — are experiencing no difficulty in finding opportunities to apply themselves and their skills in all sorts of civilian activities.

Although the members of this middle-aged group are, or soon will be, carrying the heaviest practical burden, they are probably more goaded than other physicians by their inability to participate in a more direct way than that permitted by their physiologic limitations. They are partially compensated by serving on various boards and committees and by more extended tours of practice, but as they find their medical journals devoting more and more space to the military aspects of medicine and surgery, and when they glance at the headlines of the daily press, they must be frequently plagued by their inability to express themselves more concretely in the war effort.

How can these middle-aged physicians remaining in civilian practice intensify their influence in the total drive against impending disaster? A partial answer for many, and a complete answer for some, may be found in the cultivation of an interest in industrial health in their towns and neighborhoods. In Massachusetts, three quarters of the industrial workers are employed by small companies. To date, the development of modern industrial medicine has been chiefly confined to the large plants, with their more serious problems and greater resources; as a result, its application to each and all the hundreds of little shops has been overlooked. Yet many of these small factories are now open night and day, thus exposing thousands of workers to hazards against which they might be very easily protected.

Who is going to cast a preventive eye on this widely dispersed problem? Who could do it more effectively than the local physician — the doctor who is asked to remove the foreign bodies, to suture the lacerations, to soothe the irritated skins, to x-ray the broken bones, to assuage the gastrointestinal disturbances and to calm the paranoid grievances of the more unstable but nevertheless productive workers? Here is a great untilled field — untilled because it does not lend itself to the wholesale methods that have brought such good results in the larger plants. The acreage is subdivided into hundreds of small plots, each of which must be worked by the hand of the local doctor, who can make himself see the possibilities of industrial-accident prevention as plainly as he saw those of diphtheria prevention twenty years ago.

If the local physician needs assistance in this matter, it is already within his reach. For a beginning, he may heed the announcement of the Committee on Industrial Health in this issue of the *Journal*. In the pamphlet there referred to, he will find a series of references and agencies that can help him. He may consult the *Manual of Industrial Health*, which will soon be issued by the Council on Industrial Health of the American Medical Association. He may subscribe to *Industrial Medicine*, the official monthly publication of the American Association of Industrial Physicians and Surgeons. Primarily, however, he should visit the plant or plants where he is occasionally called to serve, and he should do so with a trained, critical and inquisitive eye. Only in this way can he

accomplish results, and only in this way can he attract the attention of employers and the more intelligent employees to these results.

The alignment of all plants and factories, regardless of their size, to the modern practice of industrial medicine and hygiene would be a stupendous contribution to the war effort; and its accomplishment is clearly the opportunity of the middle-aged physician who remains in civilian practice.

OBITUARY

WALTER JOSEPH LAMARCHE

1859–1942

The death of Dr. Walter J. LaMarche on May 30, 1942, after a short illness calls for recognition. He was in his eighty-third year and had practiced medicine in Cambridge for fifty years, where his kindly manner and personal interest in his patients earned him their respect, friendliness and loyalty. His interest and his care were as sincere and genuine in his visits to the hopeless and incurable at the Holy Ghost Hospital for Incurables, which he served many years, as it was with his private patients, who offered a more hopeful prognosis and gave more inspiration — a test that many of us find hard to meet. He was for several years identified with the Orthopedic Department of the Massachusetts General Hospital and faithfully gave to it his time and attention.

He had been a pupil of Pasteur in Paris; his command of the French language helped him to a personal touch with the great scientist, and at times with his friends, almost always after a little urging, he would reminisce thereof. Dr. LaMarche was popular among the profession and invariably courteous to his confreres. He will be greatly missed by his many patients, of both short and long tenure, who benefited by his constant kindness and understanding.

Requiescat in pace.

A. W. D.

MEDICAL EPONYM

Profeta's Law

This law was enunciated by Dr. Giuseppe Profeta (1840–1910), of Palermo, in an article, "Sulla Sifilide per Allattamento [Syphilis from Nursing]," that appeared in *Lo Sperimentale* (IV series 15: 328–338 and 339–418, 1865). A portion of the translation follows:

> Thus, the healthy child born of a syphilitic mother may with impunity take the breast of its own mother or that of a syphilitic nurse, and neither the milk nor the presence of infectious lesions on the breast of the mother or the wet nurse is capable of transmitting the disease.

R. W. B.

MASSACHUSETTS MEDICAL SOCIETY

COMMITTEE ON INDUSTRIAL HEALTH

The Committee on Industrial Health calls the attention of the fellows of the Society to a pamphlet, *Manual on Industrial Health for Defense*, which has been prepared by the Division of Health and Social Services, Massachusetts Committee on Public Safety, and is being distributed this week to all practicing physicians within the Commonwealth by the Massachusetts Department of Public Health. It should be especially suggestive and of interest to those physicians who work for a few hours daily, or only in a casual way, caring for industrially connected illnesses and accidents. The Committee on Industrial Health bespeaks the attention of all such physicians for this little publication.

Dwight O'Hara, *Chairman*

COMMITTEE ON MATERNAL WELFARE

Case History: Operative delivery followed by shock and death

A twenty-eight-year-old primipara had been seen routinely during her pregnancy and had had adequate care. At the beginning of pregnancy, a blood Wassermann reaction had been reported positive, and in consequence of this, thirty injections of bismuth had been given; the Wassermann reaction at the end of pregnancy was said to have been negative. At this time, the systolic blood pressure rose to 130, and there was a trace of albumin in the urine. Labor started three days after spontaneous rupture of the membranes and lasted forty-one hours. Then, primary inertia of the uterus developed, and as full dilatation existed, forceps delivery was attempted. In spite of the fact that the head was low, delivery was so difficult that the fetus was decapitated, and extraction of the shoulders was accomplished only with great effort. The placenta was said to have been adherent, and was extracted manually. The patient died shortly afterward.

Comment. It is regrettable that any patient who had such intelligent and adequate care during the prenatal period should have been so mishandled at the time of delivery. It is, of course, possible that a so-called "dry uterus" resulted in a con-

traction ring and that this may have been the sole cause of difficulty. Or, if a contraction ring did exist, which seems likely, death may have been due to rupture of the uterus.

Intelligent obstetric management during labor would have obviated this maternal fatality. There is some question in the history regarding just when the death of the fetus occurred, but it apparently died during labor. If so, intelligent obstetrics should also have averted this disaster. Such bungling obstetric operating today is hardly understandable and certainly not to be condoned.

MISCELLANY

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR JUNE, 1942

Diseases	June 1942	June 1941	Five-Year Average*
Anterior poliomyelitis	0	1	6
Chicken pox	1265	1170	1134
Diphtheria	14	11	9
Dog bite	1414	1265	1370
Dysentery, bacillary	2	14	13
German measles	1328	535	181
Gonorrhea	355	302	364
Measles	3654	3923	3527
Meningitis, meningococcal	19	16	8
Meningitis, other forms	10	—	—
Mumps	1325	1113	719
Paratyphoid infections	8	5	14
Pneumonia, lobar	160	207	242
Scarlet fever	793	639	669
Syphilis	512	391	424
Tuberculosis, pulmonary	342	264	293
Tuberculosis, other forms	26	22	33
Typhoid fever	4	7	6
Undulant fever	3	6	5
Whooping cough	951	978	717

*Based on figures for preceding five years.

Geographical Distribution of Certain Diseases
June, 1942

Diphtheria was reported from: Boston, 1; Boylston, 1; Cambridge, 1; Fall River, 8; Medford, 2; Wrentham, 1; total, 14.

Dysentery, bacillary, was reported from: Beverly, 1; Waltham, 1; total, 2.

Encephalitis, infectious, was reported from: Leicester, 1; New Bedford, 2; Quincy, 1; Springfield, 1; Wellesley, 1; total, 6.

Malaria was reported from: Camp Edwards, 1; total, 1.

Meningitis, meningococcal, was reported from: Amesbury, 1; Beverly, 1; Boston, 3; Brockton, 1; Cambridge, 3; Chelsea, 1; Fort Banks, 1; Haverhill, 1; Hopkinton, 2; Medford, 1; Newton, 1; Peabody, 1; Taunton, 1; Wilmington, 1; total, 19.

Meningitis, other forms, was reported from: Beverly, 1; Boston, 2; Brockton, 2; Cambridge, 1; Dedham, 1; Foxboro, 1; Leominster, 1; Malden, 1; total, 10.

Paratyphoid infections were reported from: Boston, 1; Ludlow, 1; Medford, 1; Salem, 4; Watertown, 1; total, 8.

Septic sore throat was reported from: Barre, 2; Boston, 3; Cambridge, 1; Canton, 1; Malden, 1; Newton, 1; Waltham, 2; Winchendon, 1; Winchester, 2; Worcester, 1; total, 15.

Trichinosis was reported from: Stoneham, 1; Belchertown, 1; total, 2.

Typhoid fever was reported from: Fall River, 1; Woburn, 1; Worcester, 2; total, 4.

Undulant fever was reported from: North Andover, 1; Spencer, 1; Wilbraham, 1; total, 3.

Communicable diseases reported at figures above their respective five-year-average incidences included chicken pox, diphtheria, dog bite, scarlet fever, measles, German measles, syphilis, pulmonary tuberculosis, meningococcal meningitis and whooping cough.

Mumps was reported at a record-high figure for the tenth time during the past eleven months.

Anterior poliomyelitis reached a record-low figure with no new cases reported this month, for the first time since the disease was made reportable.

Reported at figures below their respective five-year incidences were bacillary dysentery, gonorrhea, paratyphoid infections, lobar pneumonia, tuberculosis (other forms), typhoid fever and undulant fever.

Cases of animal rabies were reported from Woburn and Attleboro, the former maintaining an old focus and the latter starting a new focus in the southeastern section of the State.

NOTES

The following promotions on the faculty and teaching staff of Harvard Medical School, effective July 1, were recently announced: George Van S. Smith, W. H. Baker Professor of Gynecology; Francis R. Dieuaide, clinical professor of medicine; Edward W. Dempsey, assistant professor ot anatomy; Robert N. Nye, assistant professor of bacteriology and immunology; Austin M. Brues, assistant professor of medicine; Robert E. Gross, assistant professor of surgery; Frank W. Maurer, assistant professor of physiology; Madeleine F. Warren, assistant professor of physiology; Wilfred W. Westerfeld, associate in biological chemistry; John H. Dingle, associate in medicine; Charles A. Janeway, associate in medicine; Nathan B. Talbot, associate in pediatrics; Leslie Silverman, associate in industrial hygiene; and Joe V. Meigs, clinical professor of gynecology.

Dr. René Jules Dubos, member of the Rockefeller Institute for Medical Research, was recently appointed George Fabyan Professor of Comparative Pathology and professor of tropical medicine at Harvard Medical School. He succeeds Dr. Ernest E. Tyzzer, who becomes professor emeritus.

Dr. Eugene A. Stead, Jr., instructor in medicine at Harvard Medical School, was recently appointed head of the department of internal medicine at Emory University School of Medicine, Atlanta.

CORRESPONDENCE

SUSPENSION OF LICENSE

To the Editor: This is to inform you that at the meeting of the Board of Registration in Medicine held on July 17, 1942, the Board voted to suspend the license of Manford R. Spalding, 129 Central Street, Auburn, Massachusetts.

H. Quimby Gallupe, M.D., *Secretary*

State House
Boston

REPORT OF MEETING

EVANS MEMORIAL LECTURE

At a Robert D. Evans Memorial Lecture at the Evans Memorial, Massachusetts Memorial Hospitals, on March 27, Dr. William Dock discussed "Albuminuria and Associated Renal Changes."

In the many years between the original theories of Bright and the more recent observations of Addis, there has been little progress in this field. It was the keen observations of the little-known Bostock, who did the actual urinalyses for Bright, that led to the latter's conclusions that: albuminuria may result from many causes, most of them trifling; the albumin in the urine is that of the blood; the specific gravity of the urine is lower in dropsy, even in the presence of albuminuria; and albuminuria results in a lowered serum protein. These fundamental observations were not significantly enlarged on or their mechanism elucidated until various clearance tests and quantitative sediment studies were carried out recently by Addis.

It is still agreed that the causes of proteinuria are many and often trifling. Grossly, such kidneys are large, yellow and greasy. Microscopically, the tubules are full of fat. Originally, this substance was considered similar to that of the fatty degeneration of the brain, heart and liver, and this theory persisted until a few years ago. The glomeruli may look normal to the uninitiated, but Bell, in 1938, demonstrated that glomerular changes can invariably be found in post-mortem examinations of persons over twelve years of age. In 1931, Marshall et al. showed from comparative studies on fish that proteinuria is dependent fundamentally on glomerular damage. Ekehorn confirmed the belief that the basic proteinuria is glomerular and that the tubules of such kidneys are called on to reabsorb large quantities of protein. The glomerular filtrate in frogs contains a higher percentage than bladder urine in severe damage, and the tubular changes may therefore be secondary.

Heymans demonstrated the tubular reabsorption of trypan blue and even a sort of phagocytic action on large foreign particles like those of India ink. In searching for a protein with a good distinguishing "tag" on it, Whipple hit on the use of hemoglobin. Injecting this substance, he determined that it does not appear in the urine until the concentration is over 100 mg. per 100 cc.; if the concentration is greater, hemoglobin spills over like a threshold substance in proportion to the serum concentration, and hemosiderin is found in the tubules like trypan blue. Only 3 per cent of the hemoglobin is found in the glomerular filtrate, compared with 30 per cent for such crystalloids as sugar, and it crosses even normal glomeruli. By this method, a dyed protein can be studied, and it is found that this one is a threshold substance, in all respects like sugar, with large amounts filtered and reabsorbed until the value exceeds the threshold. The glycogen in the tubules of diabetes is similar to the stored protein in proteinuria except for the different parts in which they are absorbed.

Known functions of the kidney include an ultrafiltration by the glomeruli and a reabsorption by the tubules of colloids, fine precipitates, water and crystalloids. The tubules also have some excretory function, notably of Diodrast, which amounts to almost 100 per cent. They also form ammonia and store iron and glycogen. To study the role of the kidney in regard to protein, a dye called Evans's blue, which is taken up by protein, is used. This is passed by abnormal kidneys only, and then in proportion to the amount of protein. Even in the normal kidney, a small amount of blue is noted in the tubules, although none is found in the urine. On the other hand, the tubules and urine are filled with the dye in proteinuria. This confirms the findings with hemoglobin and indicates that proteinuria is a result of glomerular dysfunction, despite the fact that Richards et al. have not been able to demonstrate the presence of protein in the glomerular filtrate.

But this method of microcannulation is inadequate to determine the small amount of protein expected. By perfusing of the kidneys with ice-cold serum, the material from the uterus is found to be identical with glomerular filtrate. Therefore, it is necessary merely to paralyze the tubules by this method and then remove the pelvic urine by ureteral catheterization. That no damage to the glomeruli results from this severe treatment is evident from the complete recovery of functions in animals that recover. By adding hemoglobin to the perfusion mixture, one can demonstrate that definite amounts of protein in about the concentration found in the cerebrospinal fluid can be collected (15 to 24 mg. per 100 cc.). The tubular reabsorption of fat and protein, therefore, is a normal phenomenon, and their presence in the tubules in large amounts is the result of overwork in an attempt to clear a heavily concentrated ultrafiltrate. It is not a true degeneration. The passage of protein in the urine occurs in inverse proportion to the size of the molecule, and this, too, is a glomerular function.

Clinically, there may be "tubular paralysis" allowing proteinuria similar to renal glycosuria. Table 1 indicates the average findings in certain renal conditions.

Early in renal disease, therefore, the tubules save the body a large amount of protein filtered by the glomeruli,

TABLE 1.

CONDITION	GLOMERULAR FILTRATE			URINE		
	VOLUME	PROTEIN		VOLUME	PROTEIN	
	liters	*mg./100 cc.*	*gm./day*	*liters*	*mg./100 cc.*	*gm./day*
Normalcy	180	20	0.36	1.0	2	0.02
Mild nephritis	180	41	7.40	1.0	200	2.00
Severe nephritis	180	62	74.00	1.0	2000	20.00

but later they, too, leak. The threshold for protein seems to be about 40 mg. per 100 cc. in the normal and mildly diseased cases and 30 mg. per 100 cc. in the chronic and severe cases.

Tubular changes in proteinuria, therefore, are secondary. The tubules are overfed, not poisoned. Actual degeneration may also be present, especially in later stages of renal disease. The lipoid tubular changes are the result of lipemia secondary to the low plasma protein. Why the glomerulus leaks has not yet been solved.

BOOK REVIEWS

The Medical Aspect of Boxing. By Ernst Jokl, M.D. 8°, cloth, 251 pp., with 55 illustrations and 4 plates. Pretoria, South Africa: J. L. Van Schaik, Limited, 1941. 17s. 6d.

This timely volume, devoted to a demonstration of the serious injuries sustained by professional boxers and, to some extent, amateurs as well, draws attention to matters very generally unknown and almost never discussed publicly.

The primary object is to prevent the known fatalities in the "prize ring" and their causes as revealed by autopsies and in other ways. The fatalities not occurring before the public and in the "prize ring" are doubtless quite as numerous, for such occurrences would be likely to be ascribed to other causes, if reported at all.

In the professional field, boxing is the only sport in which the major competitive effort is directed to the adversary's head. The skull is more or less elastic and is of somewhat variable thickness in different persons. Hence, severe, individual blows on certain localities momentarily change the diameters of the cranial cavity; as a result, the soft contents may be so severely disrupted that serious hemorrhage occurs. This may be subdural or more deeply seated. Occasionally, there may be an actual skull fracture by *contrecoup*.

Aside from such tragedies, which are by no means unusual, statistics show that oft-repeated blows on the head result in a condition known as "punch drunk." This appears to be best explained by small multiple hemorrhages, scattered over and through the brain. About 5 per cent of all professional boxers suffer from it if they keep at the game long enough. Its symptoms are both physical and mental. Quite a considerable number of them require institutional treatment.

In addition to these major injuries, there are many others, some of which are nearly as serious.

The attitude of colleges and schools, athletic trainers and others concerning the value of boxing in courses of physical training was obtained through questionnaires and was rather illuminating in many ways. The brutalizing effect of the sport on certain of its professional exponents, as well as on the portion of the public that patronizes exhibitions, is emphasized.

The facts brought out by the author should give food for thought in wartime, when so many young men are being inducted into services in which boxing is regarded and encouraged as a desirable means of training. The book should have a wide circulation and careful consideration.

The Baker Memorial: A study of the first ten years of a unit for people of moderate means at the Massachusetts General Hospital. By Haven Emerson, M.D. 8°, cloth, 75 pp. New York: The Commonwealth Fund, 1941. 50c.

This is a carefully written survey of an institution unique in the annals of American medicine. The operation of the Baker Memorial has been a success, and after some misgivings, all physicians connected with it, as well as their patients, are nearly universal in approving the service rendered. Such an institution could be duplicated elsewhere in the country, but before doing so, as Dr. Emerson points out, many factors must be taken into consideration. Experience has shown that to be adequate in all respects, such a hospital must be an integral part of a large general hospital, must maintain a daily census of not less than 200 patients, and must have a bed-day rate of $4.00 to $6.00 and a capital investment of $2,000,000; furthermore, the trustees must find an additional $500,000 for an endowment fund to meet operating deficits in the first ten years. Any surplus should be used to improve service or reduce rates, the staff must submit to certain financial standards, and patients must be selected. Any community that wishes to provide a hospital for patients of moderate means will do well to consider with great care the report of the first ten years of the Baker Memorial.

The Story of Clinical Pulmonary Tuberculosis. By Lawrason Brown, M.D., 8°, cloth, 411 pp., with 1 portrait. Baltimore: Williams and Wilkins Company, 1941. $2.75.

Few people are so well qualified to write the story of the evolution of clinical tuberculosis as the late Dr. Lawrason Brown. During his lifetime, he witnessed and contributed to the emergence of tuberculosis from a disease of despair to one in which early diagnosis could be established with a high degree of certainty and treatment instituted on a rational and sound basis. Dr. Brown, more than anyone else, epitomized the scholar, the clinician, the teacher and the enthusiastic worker in the field of tuberculosis. It is therefore most fortunate that Mrs. Brown and a group of Saranac Lake physicians have painstakingly gone over his historical notes, compiled them in book form and handed them over for posterity as a monument to a truly great man; a debt of gratitude is due them.

The book, which is written in a very fluent and delightful story-telling style, can be read with equal enjoyment by the laity and the medical profession. The first four chapters describe visits to the tuberculosis experts of the period 1700 to 1900. In these chapters, the dramatic changes in the concepts of tuberculosis are given against the background of the Renaissance and the pulsating history of European events during that time. Part two of the book deals with Laennec and his successors and also considers the beginning of early diagnosis, early publications in Germany and Austria and the diffusion of knowledge in England, as well as a most complete and fascinating chapter on early diagnosis as it was developed in the United States. The chapter on diagnosis by x-ray methods was contributed by Dr. Homer L. Sampson, and the chapter on the development of surgical methods was written by that great pioneer in thoracic surgery, Dr. Edward W. Archibald, of Toronto. There are excellent sketches and sidelights on the life of Laennec and his writings on the story of the stethoscope and a description of early medical journals.

On the whole, this book constitutes the most comprehensive work on the history of pulmonary tuberculosis. Its story keeps the reader's interest from its very beginning to the end. This book will undoubtedly find its place among the best authoritative works on the history of medicine.

Biology of the Laboratory Mouse. By the staff of the Roscoe B. Jackson Memorial Laboratory. Edited by Dr. George B. Snell. 8°, cloth, 497 pp., with 172 illustrations and 37 tables. Philadelphia: The Blakiston Company, 1941. $7.00.

The staff of the Roscoe B. Jackson Memorial Laboratory are to be congratulated on this very useful book. The editor makes the following significant comment in the preface:

"Because it deals with the mouse alone, this book presents a vertical cross-section of biological knowledge rather than the more usual horizontal cross-section. It contains information about one animal drawn from various branches of zoology, rather than information about one branch of zoology drawn from observation of a variety of animals."

There are thirteen chapters, which deal with the early embryology of the mouse, reproduction, histology, spontaneous neoplasms in mice, gene and chromosome mutations, the genetics of spontaneous tumor formation, the genetics of tumor transplantation, endocrine secretion and tumor formation, the milk influence in tumor formation, inbred and hybrid animals and their value in research, parasites, infectious diseases of mice, care and recording. The illustrations are many and good, the index is useful, and most valuable, perhaps, is the excellent bibliography at the end of each chapter. Every library should own a copy of this book, which deals with a mammal so widely used in all laboratories.

(Notices on page ix)